

MEDIASET GROUP END-TO-END TV PRODUCTION IN DIGITAL FORMAT

Italy's leading broadcaster is tuning into Cisco Systems® COMET Multi-Service Optical Platform as the foundation for its next generation TV production network.

Background

The Mediaset Group is Italy's leading privately-owned communications and broadcasting group and one of the largest broadcasters in the world. It is also one of the most profitable and was featured among the top 500 in the Financial Times' list of "The World's Top Companies."

The group operates in a fast changing environment where Government is laying down new rules regarding ownership and market share, privatising the public broadcaster Radio Televisione Italiana (RAI), and setting targets aimed at an overall switch from analogue to Digital Terrestrial Television (DTT) by January 2007. DTT is a central element of the new legislation as it is seen as a means of reducing the 'digital divide' by providing easier access by all citizens to e-government services.

Challenge

The Italian legislature required that all broadcasters in the country develop the ability to transmit digital signals, and set the launch of DTT services for early 2004.

In complying with the government requirements, Mediaset wanted to repeat the success of an earlier project that linked its three production centres in Milan with a fibre optic network supporting an increasingly end-to-end digital workflow. The new network had removed the bandwidth bottleneck and atmospheric reliability issues of microwave links and the need to physically transport large numbers of videotapes from site to site. Unable to lay its own dark fibre in Rome, in order to repeat the success it had enjoyed in Milan, the broadcaster needed to find a more cost-effective solution to link its three production centres in the capital.

"THE DWDM PLATFORM FROM CISCO IS THE BEDROCK OF OUR SOLUTION IN ROME. AS THE DEVELOPMENT OF OUR FIBRE OPTIC NETWORK CONTINUES WE EXPECT DWDM TO PROVE ITSELF ONE OF THE BEST SOLUTIONS AVAILABLE TO US".

Marco Pellegrinato
Deputy Director of Technical Engineering
Mediaset Group

Solution

Elettronica Industriale, Mediaset Group's networking facilities subsidiary, has chosen the Cisco® Complete Optical Metro Edge and Transport (COMET) solution, based on the Cisco Optical Networking System ONS 15454 Multi-Service Transport Platform, to provide the next-generation production network in Rome. Based on Dense Wavelength-Division Multiplexing (DWDM) optical technology, this carrier-class platform not only supports the efficient and reliable transport of broadcast quality Serial Digital Interface (SDI)-based video over transparent transponders/lambdas (optical channels), but also 10 Gigabit Ethernet to deliver world-leading flexibility and cost-effectiveness. This combination of bandwidth and multi-service flexibility proved the most cost-effective way of maximising leased fibre optic capacity.



Results

Capable of supporting up to 32 Lambdas, each running up to 10 Gigabit Ethernet or STM (Synchronous Transport Module) - STM-64, the new fibre optic ring will remove the bottlenecks and weather-based transmission problems of the microwave-radio links it replaces, enabling the evolution of a completely digital production environment as the group prepares for the expected complete switch-over from analogue to DTT scheduled for 2007. Moreover, DWDM is seen as the model for a new network foundation for the entire group, the basis of a national infrastructure supporting new ways of highly efficient and innovative program making.

THE COMPANY PRIDES ITSELF ON ITS ECONOMIC, FINANCIAL, AND CREATIVE INDEPENDENCE, AND ITS ABILITY TO COMPETE IN A SECTOR CHARACTERISED BY CONSOLIDATION AND RAPID CHANGE.

The Need for Efficiency Drives Innovation

Part of the Fininvest Group, Mediaset is better known through its national television channels Canale 5 – the nation’s most popular prime-time network – Rete 4, and Italia1.

The company prides itself on its economic, financial, and creative independence, and its ability to compete in a sector characterised by consolidation and rapid change. Like the state broadcaster RAI, Mediaset boasts 45 percent of the available advertising market, with around 2000 small television companies jostling for a share in the remaining 10 percent.

In 2002, the group posted profits of EU€362 (US\$457) million, based on advertising revenues of EU€2,431.8 (US\$3,067) million – a remarkable 45.7 percent increase in net profit on advertising revenue that rose only 0.4 percent the previous year.

An important factor in this achievement was the group’s success in reducing its operating costs by around 10 percent compared to the previous year, while simultaneously providing programming that drove audience figures to record highs.

The improvements are the result of a carefully designed strategy: With the global economic slowdown at the turn of the millennium, Mediaset was facing flat advertising revenues and responded with a series of measures to reduce its cost base. Part of this response was a far-sighted strategy of investing in its Milan-based production facilities with the creation of a ‘fibre-to-the-desktop’ network environment and the migration towards digital networking with the creation of a digital newsroom.

“The results were very encouraging,” explains Marco Pellegrinato, Deputy Director of Technical Engineering for the Mediaset Group. “We created a digital environment for about 100 journalists, managers, desk-based staff and support people. We migrated the entire production process over to digital methods of working, giving journalists the ability to edit and create programs directly from their workstations. Importantly, footage is now taken from video servers as file transfers as opposed to the delay and cost of physically transporting video tape from one location to another.”

But in seeking to create a similar environment for its three production centres in Rome, Mediaset soon realised that it would not be possible to repeat exactly the same recipe for success due to the high cost of renting an adequate amount of fibre optics on an extension of about 50 km between those production centres.

Milan’s Fibre Optic Production Network

Elettronica Industriale is the wholly-owned subsidiary of Mediaset responsible for managing the development and maintenance of Mediaset’s signal broadcasting and distribution equipment, both via satellite and microwave link network. A national broadcasting centre broadcasts to some 22 million households via a network of 14 regional centres, nearly 1,800 stations, 2,300 radio bridges and some 4,700 emitters and repeaters.

In 1998, with the relaxation of the state monopoly on the provisioning of telecommunications services, Elettronica Industriale was able to lay fibre optic cable between the company’s three production centres in Milan situated about five kilometres from one another. The following year, some 100 fibre optic cables were laid to replace a network of microwave radio links, which typically operated at 45 or 155Mbit/s. Not only did the links provide a potentially six-fold increase in available bandwidth, moreover fibre optic does not suffer from the problem of

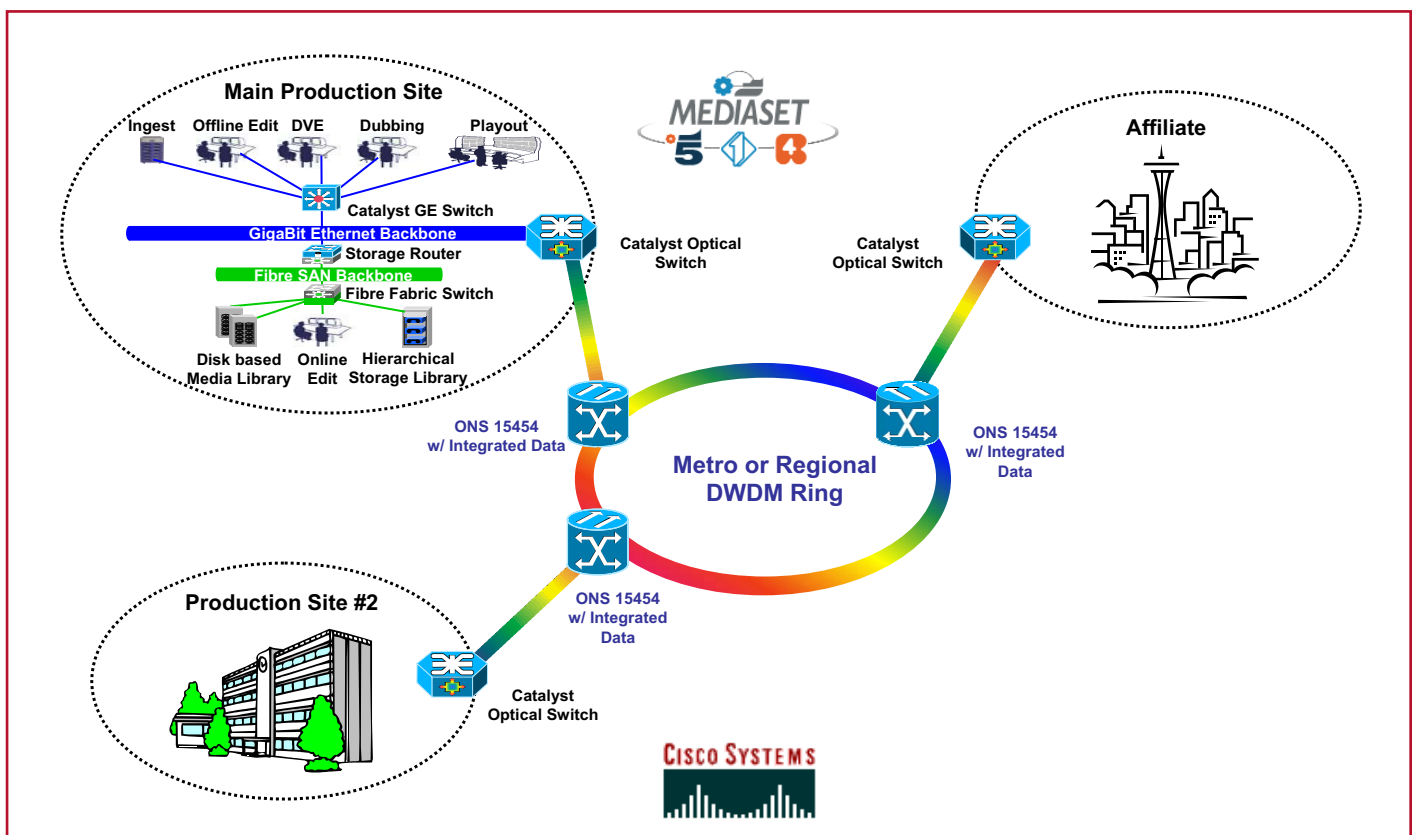
atmospheric disturbance caused by changes in the weather, or the oxidation that affects copper cabling.

“With so much fibre it was easy to replace the radio links with one point-to-point fibre pair being used to transmit a single video stream at the standard SDI rate of 270Mbit/s,” recalls Pellegrinato. “While the digital newsroom and the new fibre optic links were separate projects, I saw the potential to create the first production network using four fibres to create 4 Gigabit Ethernet rings between the three centres. Interconnection between

network architecture is based on a complete fibre optic infrastructure from backbone to desktop, accessed by more than 800 workstations distributed around the geographic domain.

A Digital Revolution

The RAV&FAV network revolutionised the way content is produced and media assets are stored and reused. Each of the three centres focuses on a core production area—one for news generation, another for entertainment, and the third on asset management. Not only did this reflect the fact that people working



Mediaset’s Multi-Site TV Production Network

the production centres had not been possible before due to the complexity of securing the necessary authorisations for the various frequencies that would have been needed.”

The new production network is known as RAV&FAV, an acronym that stands for an Italian phrase that translates as “the fibre optic network for TV production communications.” Very conscious of the stringent requirements for supporting broadcast quality video and associated production applications, the new network design was conceived as a physically separate layer from the corporate LAN. On it, a quiet revolution was to take place. RAV&FAV

in each area had similar requirements, which differ from their colleagues’ in other centres, but the flow of video tapes between centres would also be minimized.

For example, some 50 percent of tapes used each day originate from Mediaset’s own archive, with the remainder coming in from third parties. The creation of a central facility, therefore, made sense.

Journalists from the newsroom can access material from the central Newsbase video server, which has been taken in directly by terrestrial or satellite links from Mediaset’s branches

throughout Italy, to create content for most of the news bulletins that go out each day.

Currently, Mediaset is in the process of migrating to a fully digital production environment, so only one of the newsrooms exclusively uses digital format video to ingest, edit, broadcast, and archive stories. This means that most of the video coming in to the news area needs to be in both tape and digital formats. A server-based news production system encodes footage in three main formats:

- High-quality 30Mbit/s MPEG2 (I-Frame only)
- Motion JPEG at 3Mbit/s and above, including uncompressed audio suitable for reediting on a journalist's workstation
- 600kbit/s MPEG1 that is used by non-journalists for browsing the archive.

All material is digitally encoded, including videotape archive footage that is encoded as soon the journalist puts the cassette into a player – and once in the digital domain it remains there. In the Playout area Mediaset uses two of the largest and most advanced video servers in the world capable of storing up to 1000 hours of material up to 50Mbit/s quality.

For a company seeking to maximise the use of its assets, the move to digital opened up a new world of opportunity. Content repurposing is the key to profitability and Mediaset is pioneering the use of a content management system, which is a platform for the management and distribution of online content. The system is an innovative polymedia software platform for the management and distribution of online content. Its distinctive features include robust multi-channel capabilities for both incoming and outgoing content material.

Using standard eXtensible Markup Language (XML) technology, the content management system accepts input from any source and uses standard XML technology to transform it into information that can be edited, distributed, stored and re-used on any digital output channel (web, mobile, iTV, Teletext). It separates legacy or acquired content from its presentation format, stores it in a relational database and prepares it for editing and quick, simultaneous distribution over traditional and new media.

Another innovative application, shared over the production network, is access to every second of programming broadcast by Mediaset and its main competitors, enhanced with actual viewing figures supplied by a third party auditor.

“Thanks to the network we are able to build very strategic, business-orientated applications that make it easier to do our jobs or to move or sell content to a third party,” says Pellegrinato.

Little wonder then, with the deadline set by the Italian government to launch its first DTT programs to 50 percent of the population, Mediaset sought to create a similar production network for its three production centres in Rome.

However, unlike in Milan, it would not be possible to lay a mass of new fibre in a city as densely populated and architecturally rich as Rome. Nor was it economically feasible to rent an equivalent number of fibres from local service providers.

A new solution was needed.

**“THANKS TO THE NETWORK
WE ARE ABLE TO BUILD
VERY STRATEGIC, BUSINESS-
ORIENTATED APPLICATIONS
THAT MAKE IT EASIER TO DO
OUR JOBS OR TO MOVE OR SELL
CONTENT TO A THIRD PARTY”**

Marco Pellegrinato
Deputy Director of Technical Engineering
Mediaset Group

A Shared DWDM Vision

Cisco Systems has been a technology partner to Mediaset for many years, providing the equipment that supports the company's corporate LAN and WANs. As a partner, Cisco has kept Mediaset informed about where its technology roadmap was heading.

“I remember attending an executive briefing conference, held by Cisco at its San Jose, USA corporate headquarters in 1999, at which the company laid out its plans for the future of DWDM,” recalls Pellegrinato. “I returned home very excited about the possibility it offered of being able to use a single fibre as a managed service to transport data transparently without a specific protocol. It appeared as a good solution on which to transport standard SDI digital video at 270Mbit/s.”

In 2003 Cisco shared the news that its new ONS 15454 Multi-Service Transport Platform could place the Synchronous Digital Hierarchy (SDH) aggregation of Gigabit Ethernet frames

alongside the transport of digital SDI signals on a transparent clear channels port.

There were two primary considerations in the development of a solution for Rome. The first was to maximise value from whatever fibre optic capacity it would need to rent. The second, was that the company wanted to ensure that the solution fitted its longer term vision creating a very high capacity, totally digital national infrastructure—first by connecting the new Rome network to Milan, and then extending to reach its regional branches and beyond to its programming partners.

The Cisco ONS 15454 Multi-Service Platform Provides the Answer

While Mediaset believed that the way forward is with DWDM technology, it started discussions with the world's leading vendors to review each offering, including that from the main supplier of its core microwave-based transmission equipment.

After four months of careful evaluation, Mediaset selected a solution based on the Cisco ONS 15454 Multi-Service Transport Platform and leased fibre optic to create a ring linking the three production centres in Rome.

One of the key factors in choosing Cisco was that Cisco alone could provide a single multi-service platform capable of supporting both the Time Division Multiplexed (TDM) and DWDM requirements of the production centres, as well as the Fast Ethernet/Gigabit Ethernet-based services required for corporate network traffic, thus reducing cost and complexity. The solution maximises not only the investment in the platform, but also the rented fibre as inter-corporate Ethernet LAN traffic comprising data, voice, or even non-broadcast corporate video—typically offered as 2Mbit/s circuits—is supported without any fear of compromising the broadcast-quality video streams carried by the other channels.

The scalability of the platform was also an important factor, as up to 32 channels can be supported in the current platform. This amount of potential bandwidth in a platform supporting a variety of protocols is particularly attractive, as the new DTT standard allows the multiplexing of several channels in a digital form—far beyond the capacity of a microwave link.

The flexibility of the platform was favoured, with all the signals managed via a 'cross connect matrix' making it a simple task to

change the configuration to accommodate new traffic patterns and requirements. Plug and Play deployment is made possible through Cisco Transport Manager which offers network-wide control of the optic transport domain.

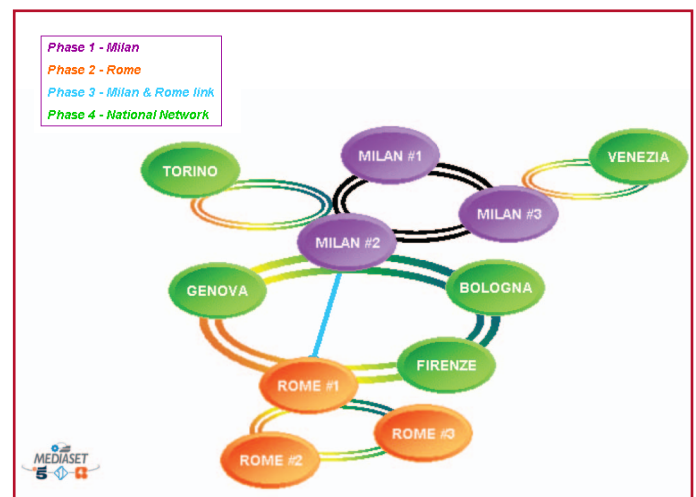
Network resilience is also built-in, with splitter-based protection mechanism ensuring that traffic failing to get through in one direction of the ring is automatically picked up coming from the other direction.

A Nationwide Fibre Optic Vision to Support DTT

Initially the new Rome DWDM network will connect to Milan via an existing STM-4 connection provided over an SDH Leased Line. A second phase of the overall networking vision will see it replaced with fibre optic using DWDM.

“In 2005 and beyond we are looking to extend the DWDM solution with dark fibre to our branch offices, linking to centres such as Turin, Bologna, Venice and others. Not only will it exchange SDI or ASI video streams, it will also enable us to extend our corporate LAN services and high-speed production network services (RAV&FAV) out to the branches,” explains Pellegrinato.

Having already experienced in Milan the benefits offered from a fibre optic digital network, the company sees the development of its end-to-end digital workflow as necessary for its continued commercial success.



Evolution of Mediaset Group's Network

On December 1, 2003, Mediaset launched its first DTT channel, broadcasting Rete 4 and five programs from third-party providers such as Class News, BBC World and VJ Television. The company also started a trial of interactive services via a set-top box to 2000 households in the Varese area, North West of Milan.

Using their remote controls viewers are able to actually participate in some of their favourite programs, perhaps challenging contestants of 'Who Wants To Be A Millionaire', asking for more information on a particular news item, or viewing the best goals from recent soccer matches.

Importantly, it will also support links—via embedded 'hot spots' in the picture—to a local store that is selling, for example, a chair or table featured in a program which has caught the viewer's eye. Advertisers are already dreaming up ever more imaginative and effective ways to entice and win business.

Pellegrinato summarizes: "The beauty of fibre optics and DWDM is that it enables us to merge different services. IP is just one of the services we can carry, just as STM can easily be used to replace or provide back-up to our microwave links. And of course we can carry SDI without disassembling the frame which is important to us. DWDM will not replace all our technologies; there is still a role for microwave and satellite. But it does provide a very versatile infrastructure able to support a range of traffic, and that is very important to us.

"The DWDM platform from Cisco is the bedrock of our solution in Rome. As the development of our fibre optic network continues we expect DWDM to prove itself one of the best solutions available to us," Pellegrinato concludes.

DTT adoption elsewhere in Europe

- In 2002 DTT launched in the UK and in Spain as pay channels, but were soon taken off the air.
- 2003 was a better year. DTT launched in Germany and the Netherlands, and was successfully re-launched in the UK as exclusively free-to-air.
- DTT in Sweden has got off to a slow start. Launched in 1999, by the end of September 2003 only some 4.2 percent of the population were equipped to receive broadcasts.
- In Finland, DTT was partially launched in August 2001 and only three multiplexes were in operation by 2004.
- In France, there is no single development model for DTT. Free-to-air DTT broadcasts, virtually absent at the outset of DTT, are now spreading quite successfully.
- In Switzerland terrestrial broadcasts to 20 percent of households located in areas with no cable access. Several places have been covered by DTT since 2001.
- In Portugal DTT licences will be allocated in October 2004.
- The Spanish government wants to re-launch DTT in 2004 using a free-to-air model.

CISCO SYSTEMS



Corporate Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters

Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters

Cisco Systems, Inc.
Capital Tower
168 Robinson Road
#22-01 to #29-01
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on the **Cisco.com Web site at www.cisco.com/go/offices.**

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia • Czech Republic
Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland • Israel • Italy
Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal
Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden
Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

Copyright © 2004 Cisco Systems, Inc. All rights reserved. CCIP, CCSP, the Cisco Arrow logo, the Cisco *Powered* Network mark, Cisco Unity, Follow Me Browsing, FormShare, and StackWise are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn, and iQuick Study are service marks of Cisco Systems, Inc.; and Aironet, ASIST, BPX, Catalyst, CCDA, CCDP, CCIE, CCNA, CCNP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, the Cisco IOS logo, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Empowering the Internet Generation, Enterprise/Solver, EtherChannel, EtherSwitch, Fast Step, GigaStack, Internet Quotient, IOS, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, LightStream, MGX, MICA, the Networkers logo, Networking Academy, Network Registrar, *Packet*, PIX, Post-Routing, Pre-Routing, RateMUX, Registrar, ScriptShare, ScriptShare, SlideCast, SMARtner, StrataView Plus, Stratm, SwitchProbe, TeleRouter, The Fastest Way to Increase Your Internet Quotient, TransPath, and VCO are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. and certain other countries.

All other trademarks mentioned in this document or Web site are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0304R)