Most events were held in the west of the city, in the region of Barra da Tijuca. The Rio Olympic Park venues are part of an extension of the City Sports Complex. Originally, the City Sports Complex was built for the Pan American Games of 2007, including the Maria Lenk Aquatic Park, Rio Olympic Velodrome and the Rio Olympic Arena.

OLYMPIC PARK

Construction of the Olympic Park, the set of facilities at the Sports Complex Cities Sports, began in July 2012. The complex includes nine sports areas in the city's West Zone, seven of which are permanent structures. After the games, the Arena Carioca 3 will become a sports school, while the other six stores will be part of the Olympic Training Center.

Sections of the Sports City originally built for the 2007 Pan American Games were reuse. These include Maria Lenk Aquatic Park, Olympic Velodrome Rio and the Rio Olympic Arena. The Concessionaire, Rio Mais, remained in charge after winning the tender with the aim to build the Olympic Center for hockey, the Olympic Training Center, the Olympic Tennis Center and Olympic Stadium Aquatics, along the margins of the Laguna de Jacarepagua.

The Maracanã Stadium has the largest capacity. Officially known as the Stadium Jornalista Mário Filho, it can accomodate 90,000 spectators and be the site for the opening and closing of the event, as well as the soccer finals . In addition, four venues outside Rio de Janeiro were hosts for soccer events in the cities of Brasília (DF), Belo Horizonte (MG), Salvador (BA) and São Paulo (SP).

PORTO MARAVILHA

The historic city center also went through a seaside urban revitalization project on a large scale called "Porto Maravilha", covering 5 km2 area. The project aims to restructure the port area of Rio de Janeiro, with the growing appeal of the city center, and improve the competitive position of the city in the global economy. Urban renewal included: 700 km of public network water supply, sanitation, drainage, electricity, gas and telecommunications; 4 km of tunnels; 70 km of roads; 650 km2 of roads; 17 km of bicycle paths; 15,000 trees and three wastewater treatment stations.

CENTRO INTERNACIONAL DE TRANSMISIÓN - IBC

The International Broadcast Center (IBC) is intended to accomodate 95 TV stations in more than 200 countries and took pictures for 5 billion viewers worldwide. The IBC occupies an area equal to eight football fields within the Olympic Park. 10.000 people went through this building. In the center of IBC, a fixed camera was installed to be used as a kind of observatory to monitor safety of the Olympic Games. The location is about 30 meters high, the equivalent of a ten-story building.

The next Olympic Games will be held in Tokyo (Japan) in 2020. The 37th Summer Olympiad of the modern era will open on July 24. The closing ceremony will happen on August 9. The motto of the games will be "connecting to tomorrow". The two ceremonies will happen at the National Olympic Stadium. The Olympics return to the Japanese capital after 56 years since it hosted the 1964 Olympics.

See you 2020!

Allied Telesis

ABOUT ALLIED TELESIS
Founded in 1987 and with offices worldwide, Allied Telesis is a leading provider of infrastructure and solutions flexible and interoperable network. The company provides video, voice and data network, with reliable solutions for customers in several markets, including government, health, defense, education, retail, hospitality and services network. Allied Telesis is committed to innovating the way in which services and applications are delivered and managed, resulting in increased value and lower operating costs.
Visit us online at www.alliedtelesis.com

Video
Monitoring Project
of the Rio 2016

Allied Telesis

Allied Telesis

Rio2016

From August 5-21, the city of Rio de Janeiro / RJ was the official host of the Games of the 36th Olympiad, the Rio 2016. In the largest multi-sport event in the world, 306 sets of medals were awarded in 42 Olympic sports, including 136 female, 161 male, 9 co-ed competitors. About 4.5 billion people worldwide watched television broadcasts of the games. Approximately 45,000 volunteers helped organize the 2016 Olympics. An impressive 7.5 million tickets were made available.

Paralympic Summer Games 2016 also were held in the city of Rio de Janeiro from September 7-18. This was the first time the Olympic Games were held in South America and the second in Latin America after Mexico City in 1968. Altogether, 206 countries and approximately 10,500 athletes participated.

INFRASTRUCTURE

Competitive events of Rio 2016 were conducted in 32 locations, divided into four regions (zones) of the city of Rio de Janeiro:

DEODORO

MARACANÃ

COPACABANA

BARRA

Deodoro Zone
• National Equestrian Center: horse racing
• National Shooting Center: sport shooting
• Modern Pentathlon Park: modern pentathlon
• Deodoro Arena: Fencing
• End Park: BMX, slalom canoeing and mountain biking

Maracanã Zone
• Maracanã Stadium: opening and closing ceremonies and soccer final
• João Havelange Olympic Stadium: athletics
• Copacabana Beach: aquatic marathon, beach volleyball and triathlon
• Maracanãzinho Gymnasium: volleyball
• Sambadrome Marquês de Sapucaí: archery arrival, marathon
• Sao Januario Stadium: rugby sevens

Barra Zone
• Olympic Training Center: basketball, handball, judo, taekwondo fights and
• Olympic Center for hockey: hockey on grass
• Olympic Tennis Centre: tennis
• Rio Olympic Velodrome: track cycling
• Maria Lenk Aquatic Center: Water polo and ornamental jumps
• Olympic Aquatics Stadium: synchronized swimming and swimming
• Rio Olympic Arena: artistic gymnastics, rhythmic gymnastics and trampoline gymnastics
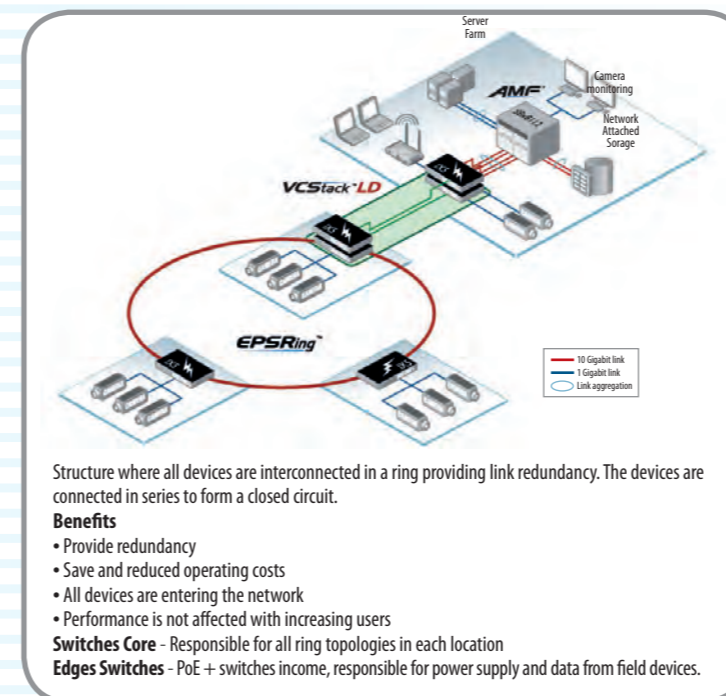• Riocentro: badminton, weightlifting and table tennis and boxing

Copacabana Zone
• Rodrigo de Freitas Lagoon: canoeing and rowing speed
• Copacabana beach: aquatic marathon, beach volleyball and triathlon
• Glória Marina: sailing
• Flamengo Park: road cycling and race walking

PROJETOS CFTV

10 Gigabit link	
1 Gigabit link	
Link aggregation	

SECURITY

Since Rio de Janeiro was named the 2016 Olympics host, problems with crime in the city have received more attention. The Rio de Janeiro mayor acknowledged issues but guaranteed the safety of the event. The IOC also expressed optimism regarding both the city and country's ability to address these concerns. A careful security project was planned to meet the IOC's needs and requirements for the Olympic Games of Rio de Janeiro.

Allied Telesis, in partnership with Local Government, Federal and the Organizing Committee of the Olympic Games, delivered a network infrastructure to support the needs of video monitoring traffic for the Olympics in Rio 2016. The IP video monitoring project developed for the Rio 2016 featured the innovative technology-Ring, developed by Allied Telesis, called Ethernet Protection Switched Ring "EPSR". Network topology Ring has the ability to form a closed circuit network providing link redundancy and lower convergence <50ms. This technology ensures cost reduction and facilitates the operation of the network.
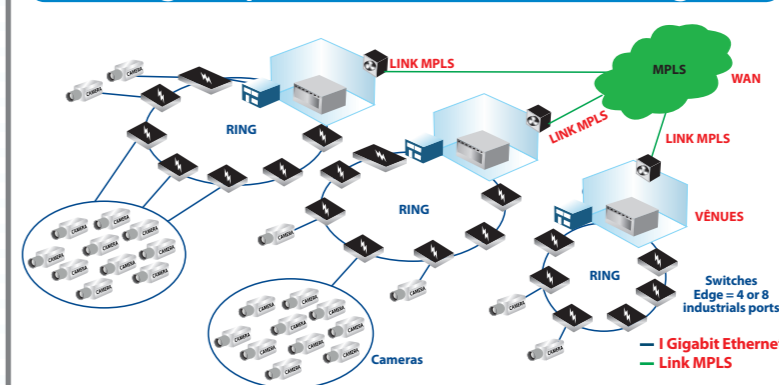
MOTIVATION AND PROJECT TYPE

The construction of video monitoring network of Rio 2016 addressed the need to manage in the easiest way the several devices and also for network redundancy with the intention of avoiding unavailability of data environment with reduced cost. The ring topology agrees to the proposed requirements. Ring topology is a concept where in all devices are interconnected to form a closed loop, providing link redundancy with reduced cost. In addition to providing redundancy and cost reduction, the ring network provides facilities for simplicity of operation. All devices enter the network equally and performance is not impacted by an increase in users. Allied Telesis possesses an innovative technology for ring networks

10 Gigabit link	
1 Gigabit link	
Link aggregation	

Structure where all devices are interconnected in a ring providing link redundancy. The devices are connected in series to form a closed circuit.

Benefits
• Provide redundancy
• Save and reduced operating costs
• All devices are entering the network
• Performance is not affected with increasing users
Switches Core - Responsible for all ring topologies in each location
Edges Switches - PoE + switches income, responsible for power supply and data from field devices.

to meet all those needs. It also provides fast <50ms convergence. With this technology, uninterrupted data transmission is guaranteed, whether they are for VoIP or IP camera Access/recordings. Considered for construction of the project were the following devices:
- **Switches Core** – responsible for ring topologies each venue;
- **Switches de Borda** – responsible for PoE + power supply and data transmission devices.

Drawing the public and venue networking

LINK MPLS · MPLS · WAN · RING · VENUES · Switches Edge = 4 or 8 industrials ports · Cameras

1 Gigabit Ethernet
Link MPLS

Switches - Core Vênue
AT-x510-28GPX - L3 stackable Gigabit Ethernet PoE + -
• 24 10/100/1000 + 4-port SFP +
• Features - RIB OSPF, PIM, UDLD, Q-in-Q, MLD, IPv6;
• redundant plant source;
• 40GB stacking, 4 units;
• 4-port 10 gigabit;
• EPSReVCStack;
• FMA = 20 units;
• POE +, 370W;
• OpenFlow.1.3;
• sflow;

Switches - Edges Industrials
AT-IE 300-12GP - Gigabit Ethernet Switches Industrials L2 + PoE +
• 8 x 10/100/1000 + 4 SFP ports;
• Features -OSPF, RIP, IPv6;
• 48VDC source;
• EPSR and AMF
• POE + 240W;
• 4 60W ports;
• Manageable

Switches - Edges Industrials
AT-IE200-6FP - Industrial Fast Ethernet Switches L2 + PoE +
• 4-port 10/100 + 2 SFP ports;
• Static -Route features, IPv6;
• Fonte 48VDC;
• EPSR and AMF;
• POE + 120W;
• Administrable;

Core Switches Switch Core local L3 - Stackable Switches	Edges switches Edge + L2 e L3 - Edge Switches
• Scalable, Reliable Technology • 30W PoE paragraph ports Feeding Devices • Redundant power supplies • The growth of the network stack JUST with new equipment • Ports of 10Gb SFP paragraph with High speed interface • Switching capacity and high transfer rate • Routing	• Scalable, Reliable Technology • Redundancy connections • 30W PoE paragraph ports Feeding Devices • Interconnection with paragraph SFP ports switch aggregation • Switching and high throughput • Routing "if it be necessary" • Temperatures up to 75 °C • PoE Auto • Flexible usage model 4 or 8 ports

OPERATION PROJECT

Each venue is provided with an MPLS link (provided by the operator), via a modem, which provides an Ethernet port that connects to the venue Core Switch for data transmission. This enables remote monitoring of all venues.
The **Core Switch** is responsible for server connections and also for the Edge Switches venue.
Edge Switches are interconnected between them. The last Switch Edge Switch Core interconnects to form the ring network EPSRing.
Edge switches are also responsible for feeding devices via PoE and supplies data to the field devices.
The optical single-mode fiber was used due to the need for connection of the devices over long distances.

The project network infrastructure is built to support traffic data, images, videos, voice, with a view to ensure the safety of the Olympics 2016. These audio and video products are the result of collaboration among Allied Telesis, the local and federal authorities linked to Public Safety and the Ministry of Justice and the Brazilian Olympic Committee (COB).