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# **Excellence in the Organization Managing Services during the Athens 2004 – Olympic Games**

**Prepared for:  
CQR 2006**

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**June 7, 2006**



**The major telecommunications event of the recent years in Greece**

# Telecommunication Network

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**OTE's Olympic Network was built to serve 6 million Games spectators, 11 thousand athletes and their support staff, 202 national delegations, and 21.5 thousand press people; it provided the following services to more than 60 venues:**

- Games Data Network Circuits**
- Leased Lines**
- Security Network - C4i Circuits**
- Commentary Circuits (telephone-quality voice and high-quality audio circuits)**
- Terrestrial Trunked Radio – TETRA (OTELink)**
- Fixed Telephony (5-digit, 10-digit, ISDN, payphones, card phones)**
- Contribution Television Network of Multilaterals and Unilaterals and CATV (between IBC and venues)**
- Distribution Television Network (from IBC to other countries)**
- Frame Relay**
- ADSL**



# Provided Services and Infrastructure: numbers

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- ❑ 43,000 new fixed telephone lines are setup and distributed among the 60 Olympic venues
- ❑ 5-digit (VPN) telephone network to serve the 60 Olympic venues
- ❑ 9,000 new terrestrial trunk radio (TETRA) connections
- ❑ 1,250 km fiber optic cables have been installed in 500 km ducts
- ❑ 3,000 ADSL lines setup for fast and uninterruptible Internet access through OTEnet, current services (ATM, V-Sat) and Intelligent Network (IN) services
- ❑ Closed distribution network for CATV
- ❑ 2.500 Leased lines of various bit rates are offered, as well as 130 international television circuits and 500 international commentary (radio) circuits to fully support the Radio-Television coverage of the Games
- ❑ An integrated network for the Olympic television and audio (commentary) signals transmission from the venues to IBC (1,500 optical fibers terminate at IBC, from three geographically independent paths)



# Service Requirements – Network Design

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OTE's Olympic Network has the following characteristics:

- Reliability, Availability, Flexibility
- Shared redundancy on protected infrastructure
- High security
- Independency of sub-networks
- Short multiplex chains
- Avoidance of SPoFs & cable crosses
- SDH equipment is installed at every Competition and Non-competition venue (more than 60).



# Realization

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## Requirements

- End-to-end Availability
- Reliability and Flexibility
- High Security
- Robust and reliable with full redundancy
- Manage unusual and burst traffic
- Mature technology

## Realization

- Central Management
- Specialized personnel & software
- Complete and integrated infrastructure of NMS/OSS
- Security monitoring through NMS
- Fully redundant design (physical and logical)
- Scalable performance
- Experienced vendors



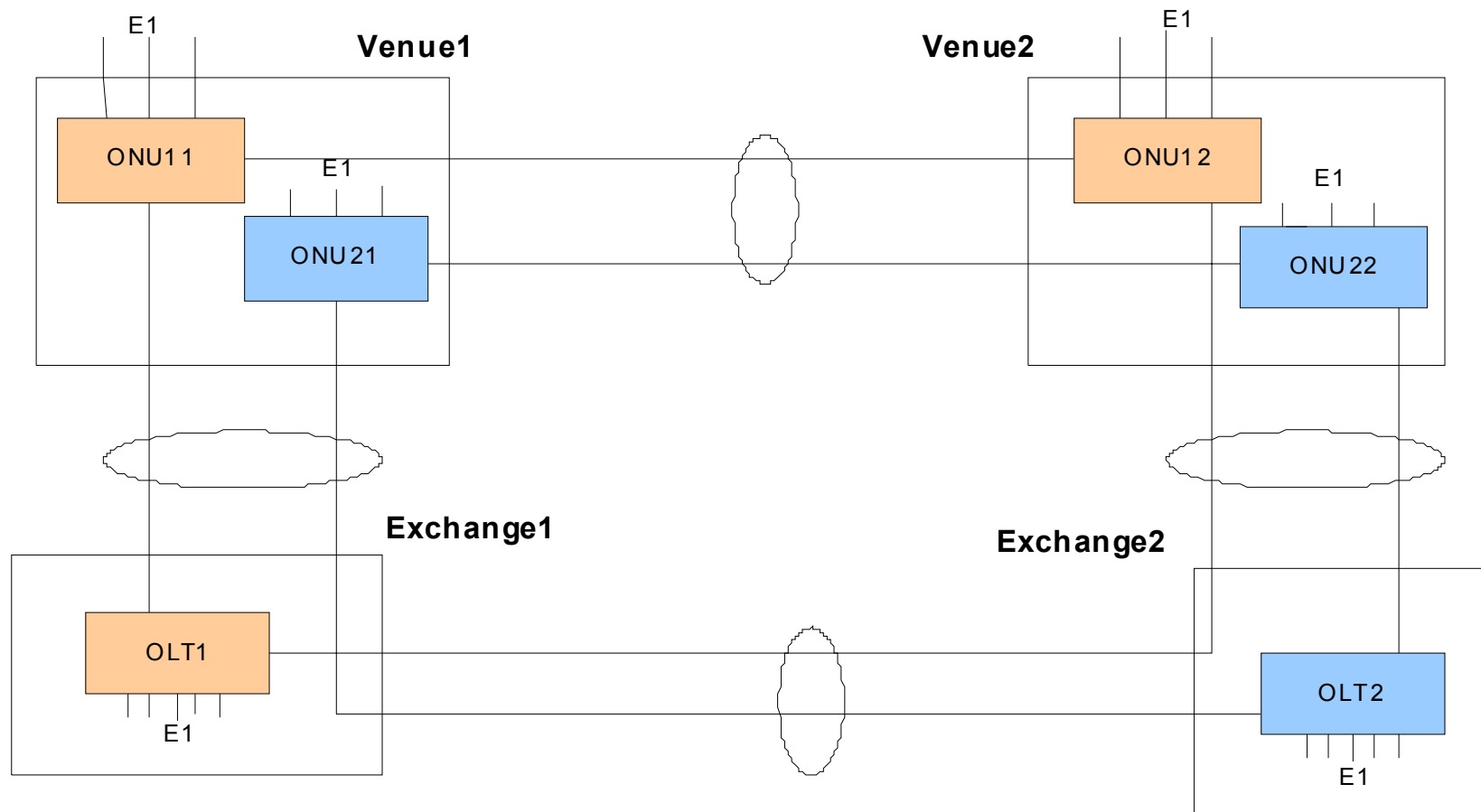
# Network Assets

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- ❑ Very robust, with alternative network routes for all paths
- ❑ Full Optical Transport Network Backbone and Access
- ❑ Ring topology
- ❑ Each venue is connected to two multiplex nodes
- ❑ Each venue is served by two Exchanges
- ❑ Ring topology to IBC also, for video contribution
- ❑ 5-digit dialing Virtual Private Network (VPN) for all Olympic Venues
- ❑ Optical SDH rings are used for the transmission of telephony, data, ISDN, audio and mobile traffic

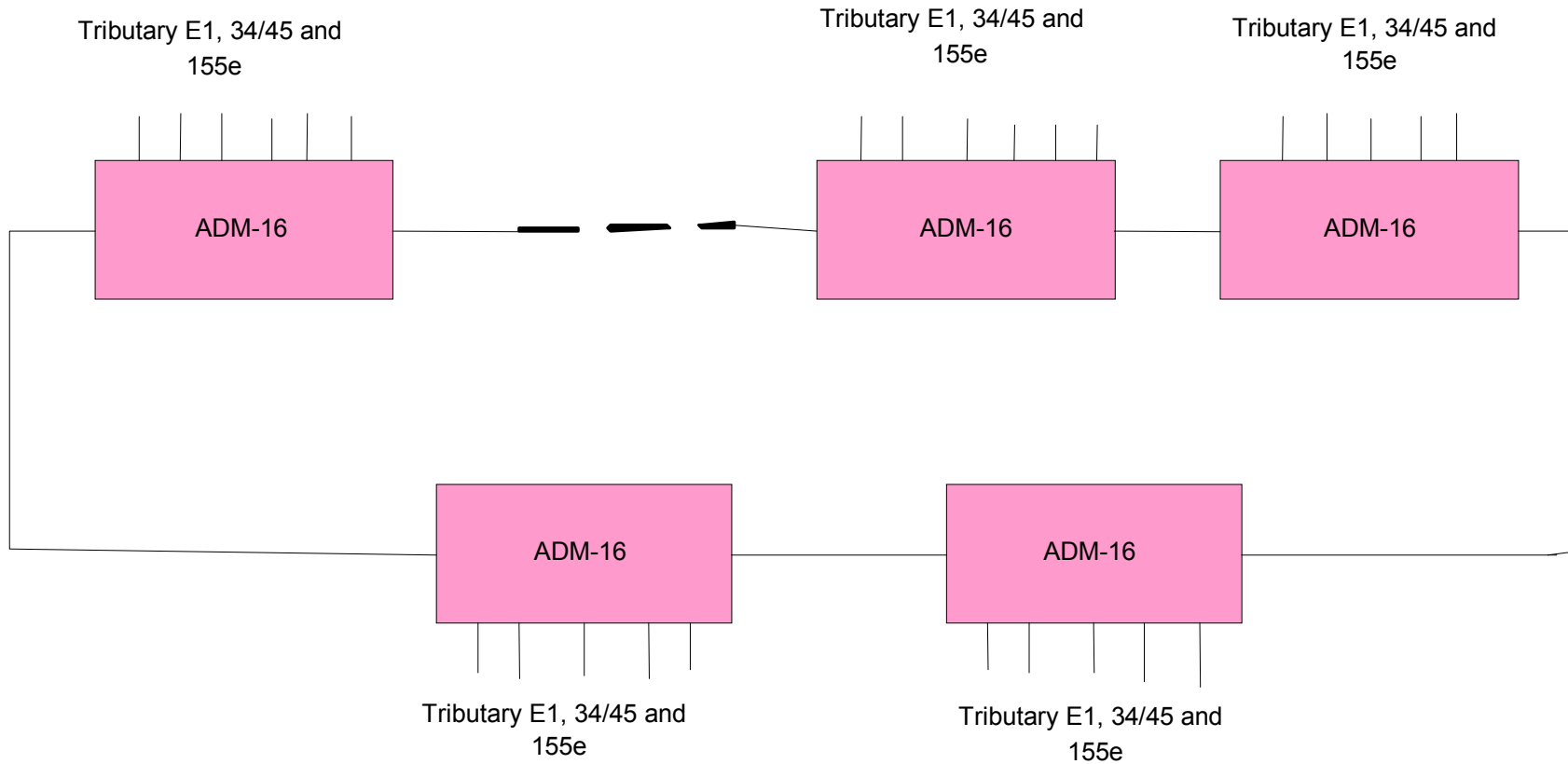


# Access Network Based on SDH Technology





# SDH Core Network – Self healing Rings





# Telecommunications Control Center - Overview

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The Telecommunications Control Center (TCC) was the single point of control and maintenance of all provided services within the Venues.

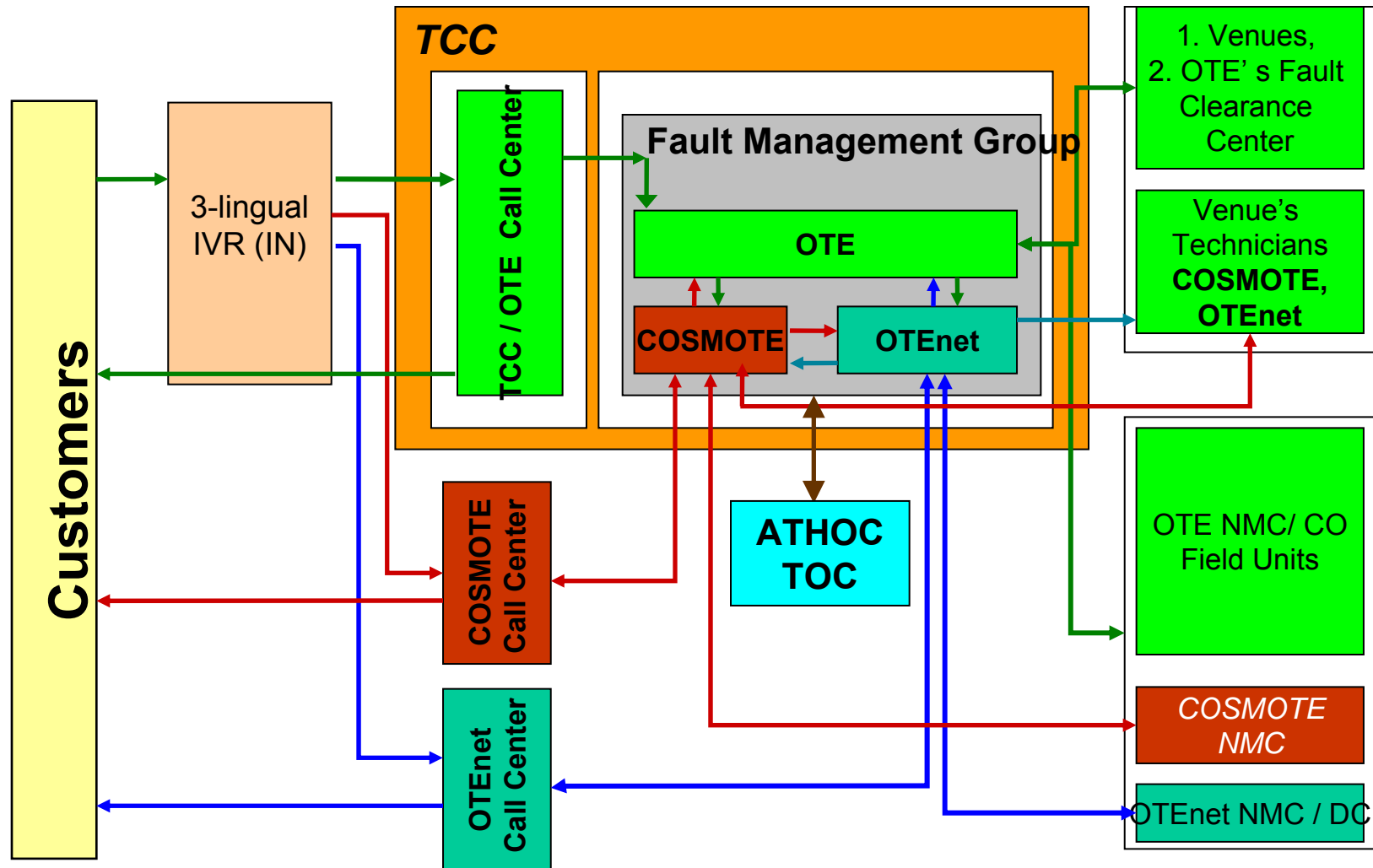
The TCC handled all types of trouble, including all installed equipment by OTE related with Olympic Games

## Operations:

- Coordination of all Venue personnel
- Handling Incoming Trouble (mainly through calls)
- Telecom Supporting
- Trouble Tickets Follow up and Closure
- Venue Interfacing
- Work Flow Management
- Network Monitoring & Management
- Security / Disaster Recovery processes
- Testing



# Telecommunications Control Center - Work Flow



# TCC Interfaces

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- ❑ Rate Card and VIK customers communicated with the TCC through the call center, by calling 1204 and using the IVR.
- ❑ ATHOC and AOB communicated with the TCC technical people directly and not through the Call Center.
- ❑ The TCC opens a Trouble Ticket in CRM for every reported problem. We used four severity levels (1,2,3,4, 1 for the highest). All tickets were followed – up by TCC.
- ❑ TCC operated in close collaboration with ATHOC/TOC.
- ❑ TCC was informing ATHOC/TOC immediately for every trouble with severity 1 and 2. Regarding severity 1 incidences, higher layers take charge and follow – up.
- ❑ TCC provided ATHOC / TOC daily cumulative reports, regarding the status of the services provided, follow – up of severe issues and statistics regarding open and closed issues.



# TCC Staffing

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- **The OTE' s TCC was staffed with 62 persons**
  - 24 agents in the Call Center
  - 4 Ticket Controllers
  - 34 Fault Management Group
- **The individuals staffing the TCC were selected on the basis of their extensive knowledge in testing, screening, and performance in workflow management.**
- **Presence of engineers from Intracom, Siemens and Oracle.**

**It operates on a 7 X 24 hours basis.**



# Managed Network Resources

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TCC provided monitoring for the OTE's entire Olympic Network in coordination with the National NMC

- Optical Network Units**
- SDH / DWDM network, circuits (2, 34, 155 Mb/s) and leased lines**
- Switching**
- Olympic VandA (Video and Audio) Circuits**
- ADSL, ATM/FR**
- TETRA**
- Optical Fibers**
- Payphones.**

**The backbone network of OTE and links was operated by the NMC.**



# Managed Network & Services – Infrastructure 1

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NMS / OSS infrastructure: TCC & National NMC

- ❑ **Optical Network Units – Optical Access Network**
  - ΔIAS (INTRACOM), Access Integrator (Siemens)
- ❑ **SDH circuits and Leased Lines**
  - MV36/38 (Marconi, Intracom), TNMS (Siemens), 1353-SH/1354-RM (Alcatel)
  - SDH Fault Integrator (NetCool, Intracom)
- ❑ **Switching**
  - Xmate (Ericsson, Intracom),
  - NetManager (Siemens)
  - RTTMS (Intracom)
  - ETTAS (Intracom)
  - AcceSS7 (Agilent, Intracom)





# Managed Network & Services – Infrastructure 2

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NMS / OSS infrastructure: TCC & National NMC

## ADSL

- BBMS (Intracom), Access Integrator (Siemens), AWS-5523 (Alcatel)

## □ ATM/FR

- MN-OSS (Ericsson, Intracom)
- MSX 46020 (Newbridge, Siemens)
- CWM (Cisco, Intracom)
- Integrated ATM MS (Intracom, Agilent, Granite)

## □ TETRA

- Dimetra (Intracom, Motorola)

## □ Optical Fibers

- AccessFiber (Agilent, Intracom)

## □ Payphones: Payphone MS (Intracom)

## □ **One 230-inch Wallboard Screen Displaying Monitor (Barco, Telmaco)**



# Managed Network & Services – Infrastructure 3

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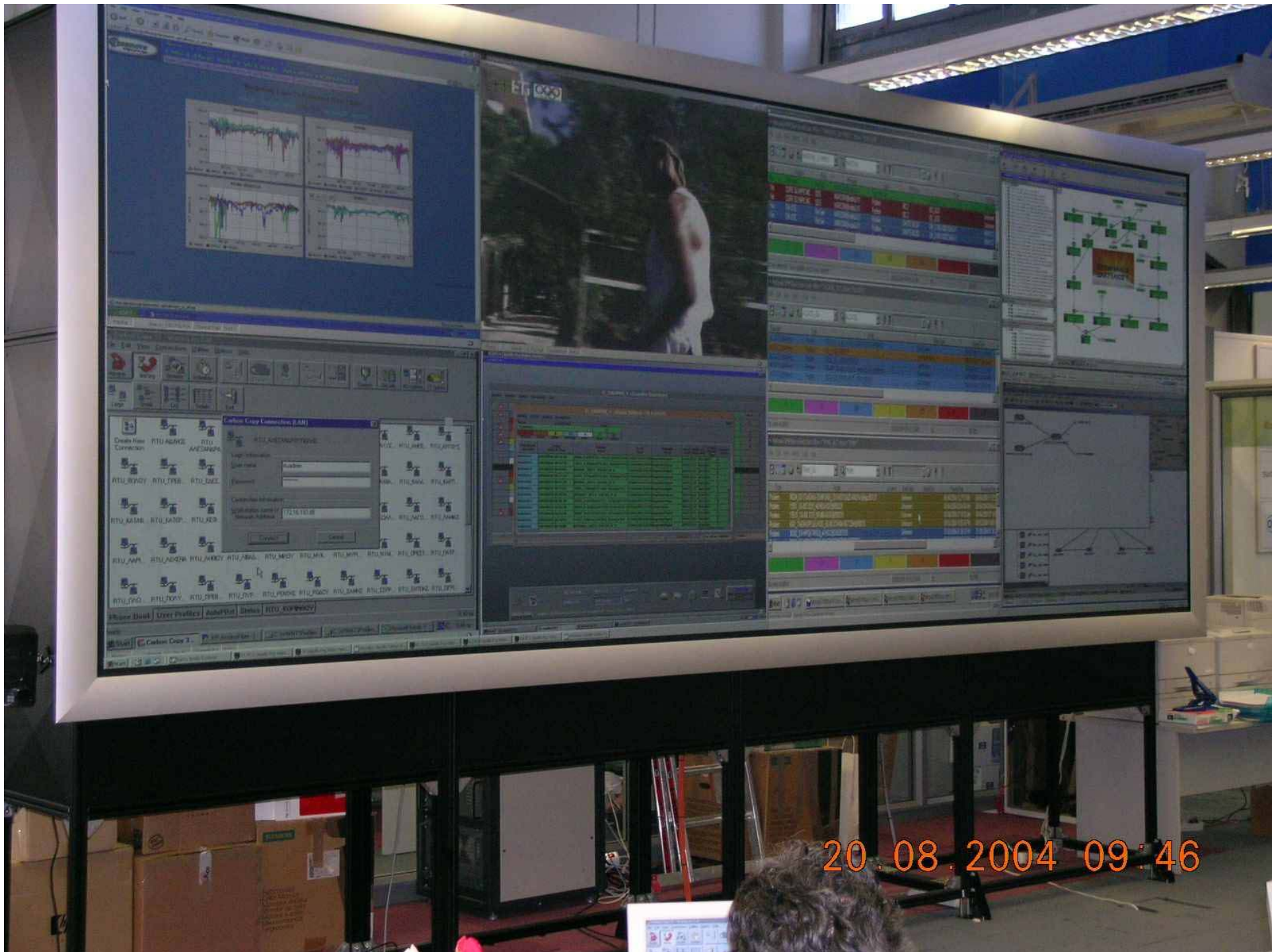
OSS infrastructure: TCC, Business and Booking Office and Technical Units

- ❑ **Trouble Ticketing and Order Entry**
  - Oracle CRM e-business suite (Oracle)
  
- ❑ **Delfi & Promitheas**
  - In house developed Oracle based applications









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# Operational Efficiency - Strong points

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- ❑ Coordinated use of all NMS/OSS applications, for every problem faced.
- ❑ Applications were continuously kept updated for the whole set of circuits and provided services.
- ❑ Use of the entire FCAPS functionality of the NMSs, not only while facing the problems, but most importantly **proactively**.
- ❑ Collocation / Close Collaboration with ATHOC/TOC
- ❑ Coordination between Trouble reporting and Network Management
- ❑ Excellent Collaboration with all OTE units, the OTE and ATHOC personnel in the venues (including the volunteers), with IOC and with our vendors.
  
- ❑ Strong and Common will for success - everybody involved!



# Difficulties

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- Very short time in order to make network and services manageable and to test services.**
- Very short time to consolidate and strengthen processes.**
- Very short life time of services, resulting in limited time to test and assure customer satisfaction.**



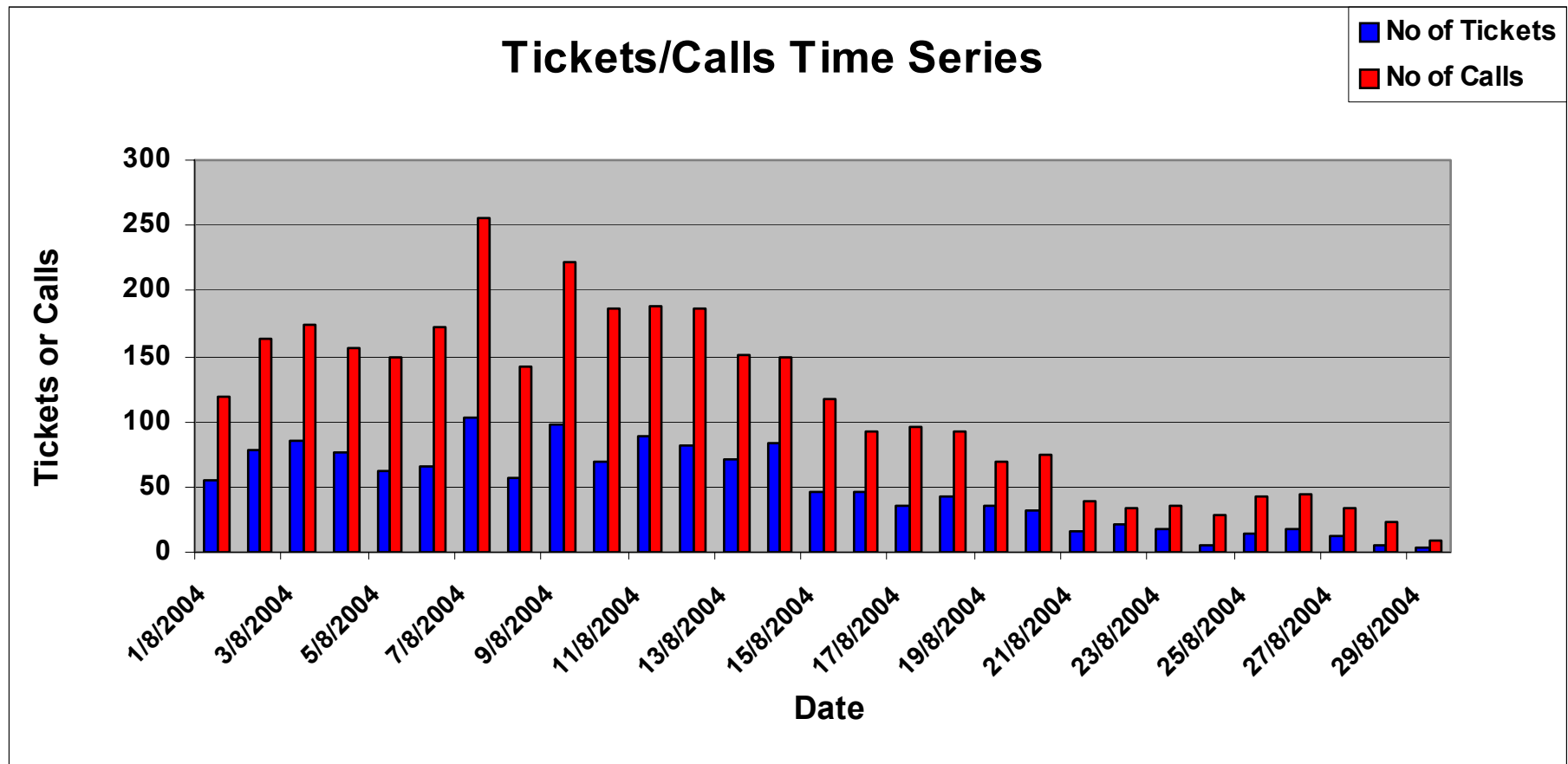
## Results: Service Availability

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- Multilaterals: 100%.**
- WAN Games και Admin: 100%.**
- 4-wire commentary circuits: 100%.**
- 2 Mb/s commentary circuits : 100%.**
- WAN high quality commentary circuits: 100%.**
- Unilaterals: διαθεσιμότητα 100%.**
- National and International TV circuits: 100%.**
- CATV from IBC to TERs: 100%.**
- Voice services (PSTN, OVPN, ISDN-BRA, ISDN child lines, ISDN PRA): 99,997%.**
- Cardphones: 99,9994%.**
- 2 Mb/s Leased lines: 99,99%.**
- ADSL: 99,95%.**



# Number of Tickets/ calls per day





# Paralympic Games

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- OTE was fully operational after the closing ceremony, throughout September.
- Outstanding network performance
- No tickets in severity levels 1 and 2.

















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# Managed Services – Overall Experience

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**“Beyond our Expectations!”**

## Results:

- Critical days like the Opening and Closing Ceremony, Busiest Day (August 20) and competition in Ancient Olympia went absolutely smoothly!
- No Severity Level 1 and 2 issues
- No congestion
- Robust backbone and access network for wireless and Internet Service providers



**Thank you for your Attention.  
Questions?**

