CASPUR: Critical Element of Internet Infrastructure and privileged observatory of Internet traffic

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Agenda

• What is CASPUR
• Caspur and University La Sapienza, Department of Informatics
• Caspur Data Center
• Caspur and the Extrabire Project
What is CASPUR

CASPUR is a Inter-University computing consortium born in 1992.
Based in Rome, branch in Bari.
Main goal scientific computing but experienced in Internet services since 1992.
What is CASPUR

Consultancy to the rising Internet Services of associated University and Public Administrations.

Nowadays is a recognized neutral qualified center for Internet service
What is CASPUR

- More than 120 employees
- 11 associated Universities
- 20 Million Euro Turnover
- Less 20% from public funds
What is CASPUR

• HPC center (High Performance Computing)
• Digital Library services
• Statistic analysis (Auditel for RAI, Italian public national broadcaster)
• Support in ICT for University and Public Administration
Caspur and Extrabire Project

• Starts from existing collaboration between CASPUR and University La Sapienza Department of informatics
• Share experience in Security and Networking
• Caspur Data Center
Caspur Data Center

• Caspur Data Center is one of the most important in Italy (Europe?)
• Build up its importants from his neutrality
• Caspur is in fact a no-profit consortium made by Universities
• Caspur is an Internet Service Provider, but a special one, Neutral and No Profit
Caspur Data Center

- Has a Tier III Data Center (TIA-942), Carrier grade
- 2 separate powern lines, 2 ups, power generator
- Video surveillance, H24 access granted
- Hosts really important internet services and Internet Network POPs
- Host three of the main network infrastructures in Italy (Commercial, Research, Public Amministration network)
Caspur Data Center
Research Network

- Caspur host the Italian National Research Network (NREN), GARR
- It host one of the most important National POP
- Networking equipments
- Services (i.e. mirrors)
Caspur Data Center
Pubblic Administration Network

• Italian Government created a Public Administration dedicated Network in 2007
• It connects all National Public Administrations
• SPC (Sistema Pubblico di Connettività)
• Tender won by 4 carriers
• Caspur host one of the two SPCs national main sites, QXN (Qualified Exchange Network) where carriers exchange their traffic
Caspur Data Center

Commercial Network

- Caspur hosts one of the most important Internet Exchange Points in Italy, NaMeX
- Carriers and ISPs interconnect each other to optimize IP traffic quality
- Circuits Interconnection
- Big concentrations of Carriers and ISPs create a natural market

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Caspur Data Center
Commercial Network

• NaMeX Carrier room
  – 17 Carriers with dedicated fibers (owned or rented) and geographical equipments (SDH, DWDM)

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Caspur Data Center
Commercial Network

**Carrier Room**

- Circuits
- Interconnections
- Market of IP transit
Caspur Data Center
Commercial Network

• Peering Room
  – 46 ISPs that exchange their own IP Traffic (AS Number)
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Commercial Network

• ISP peers at IXP to optimize their traffic quality (rtt)
• Create redundancy
• Balance traffic
Caspur Data Center
Contents & Internet Connection

- Due to this huge amount of circuits availability and internet bandwidth, lots of private companies or PAs or Universities host their contents in CASPUR Data Center

- Same reason why private/PA/University choose Caspur Data Center as a point of exit of their Internet Traffic
Caspur Data Center
Contents & Internet Connection

• CASPUR DC was chosen by the biggest CDN & Content Providers Google and AKAMAI

  Akamai   YouTube   Google

• Many National PA choose CASPUR Data Center for internet connection and contents hosting

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Caspur Data Center

Contents & Internet Connection

• Due to the same reasons Caspur Data Center host a **replica** of one most critical Internet Service: DNS

• “.” J-Root, F-root

• .com

• .net
Caspur and Extrabire Project

• The proposal of Extrabire Project is based on the idea that CASPUR data center is an “island” that could simulate the Italian Internet.

• There is a huge amount of data available from Caspur Network to the three main Internet Network: Research, PA and commercial

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Caspur and Extrabire Project

- CASPUR ISP has been used to acquire data:
  - Analyze real traffic exchange patterns
  - Analyze Interdependencies among network nodes and links
  - Analyze and correlate traffic to malicious events
Thank you

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