CCK

Centre de Calcul el-Khawarizmi

Pr. Habib Youssef
Director General,
CCK, Campus Universitaire Manouba,
2010Tunis, Tunisia
www.cck.rnu.tn

AfREN meeting, Tunis, June 1st, 2015

TUNISIA – FEW NUMBERS

- At the crossroads between Europe, Africa and Middle-East
- Area : 164 000 Km2
- Population of nearly 11 million
- 13 Public Universities for about 200 Colleges
- Faculties of all ranks: nearly 30 000
- Number of students: 315 000 at public universities, with about 80 000 in ICT

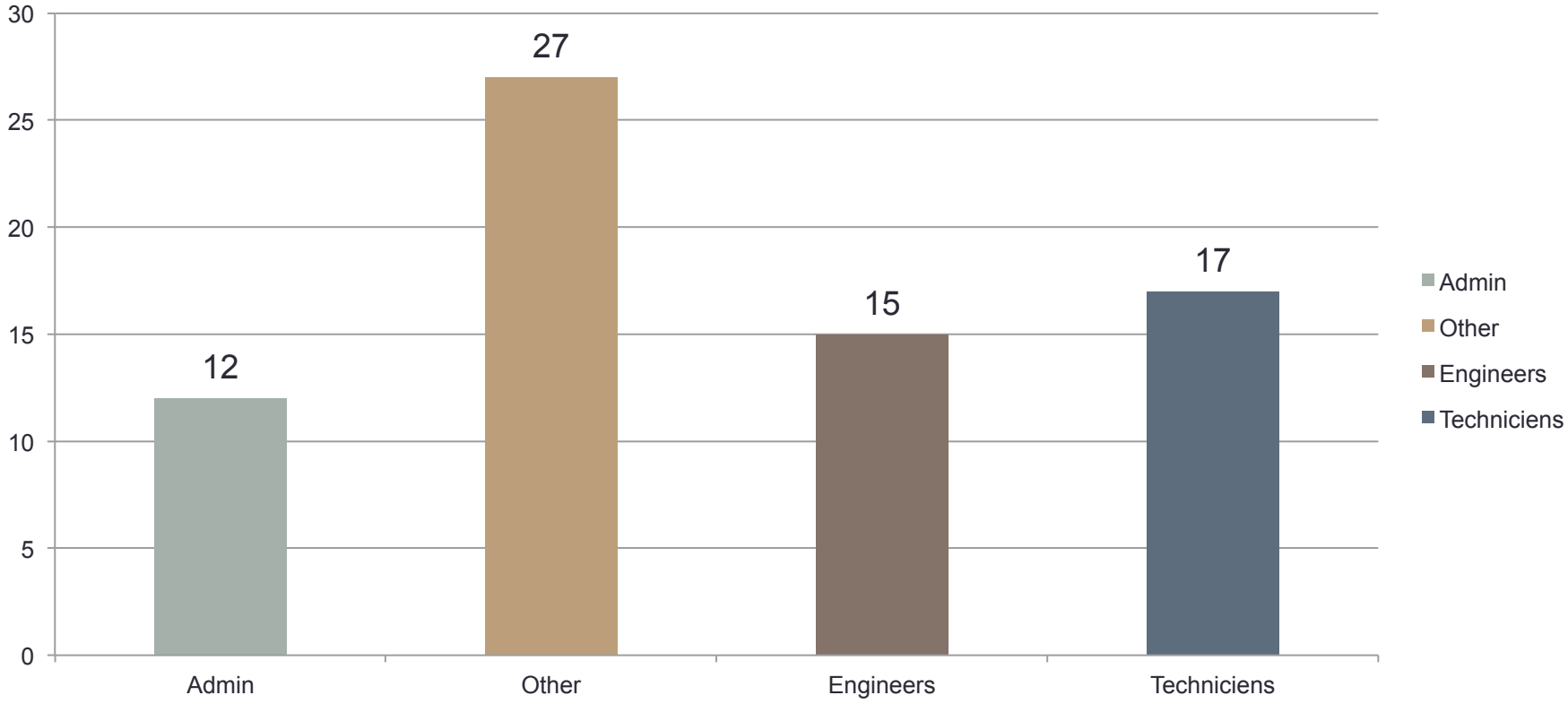
CCK: Centre de Calcul el-Khawarizmi

- Created in 1976
- Provides
  - Core networking infrastructure with Internet access (Wired and wireless connections)
  - Monitoring and Security Services
  - Internet Information Services
  - Several Academic services
  - Mobile services
  - Production and distribution of informational systems oriented to university and scientific circles (Application and System Development)
  - Training
  - Consultation and advisory role services
  - Observatory role of technological and scientific development in IT in the academic field (Technology planning, technology watch and standards)

CCK-Manouba: 2004

CCK-Manouba: 2015

Human Resources



1976 – 1997: The Beginning

- Services provided
  - Computing services for the academic community (supports teaching and research)
  - Host to application services used by a variety of entities
    - locally developped applications, e.g. results of national exams (high school, primary school, orientation, Student Affairs, etc.)
    - acquired, e.g. statistical packages, simulation environment, software environment for scientifc computing, etc.

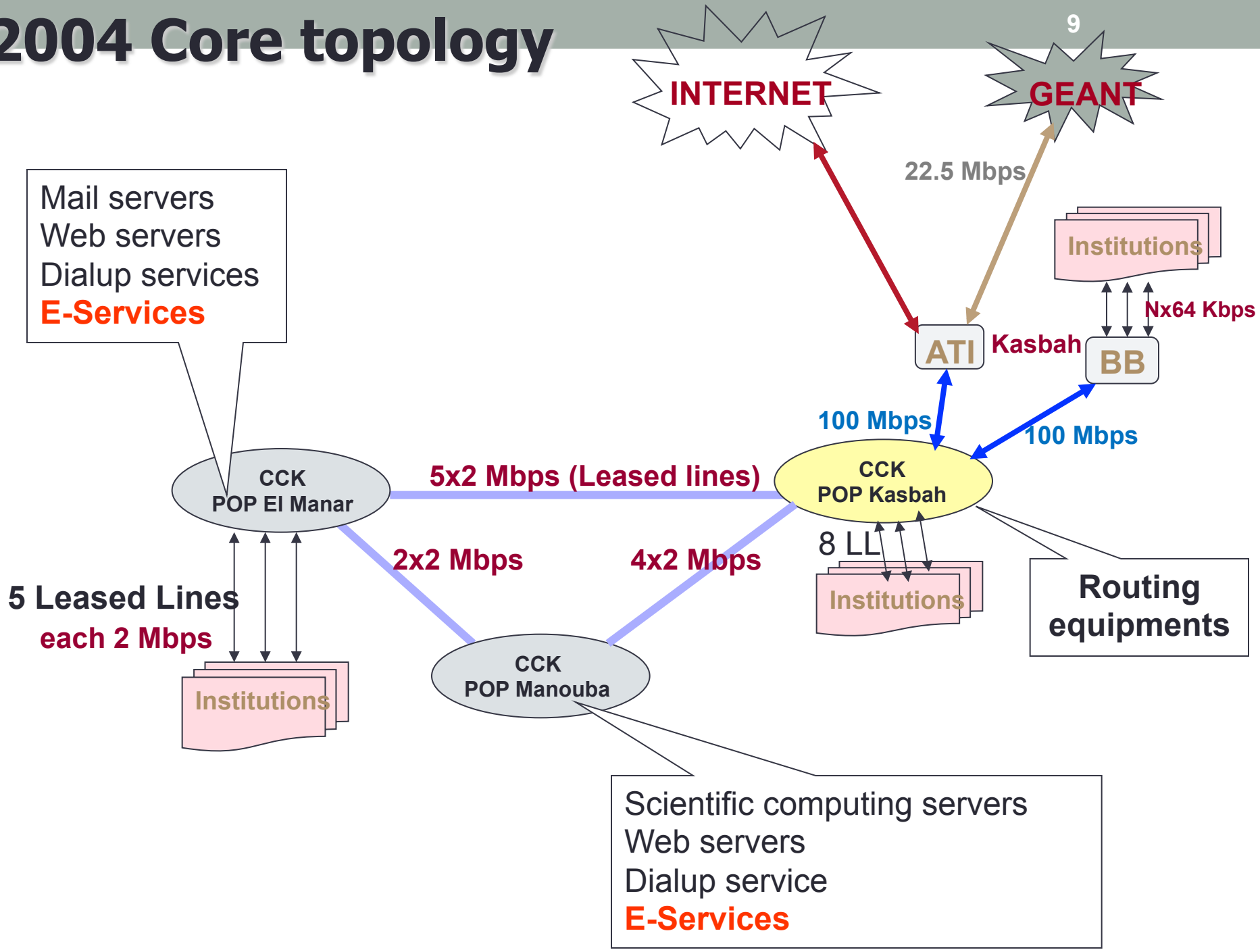
Since 1997 – Internet Service Provider

- It became the sole Internet Service Provider for all public research and higher education institutions.

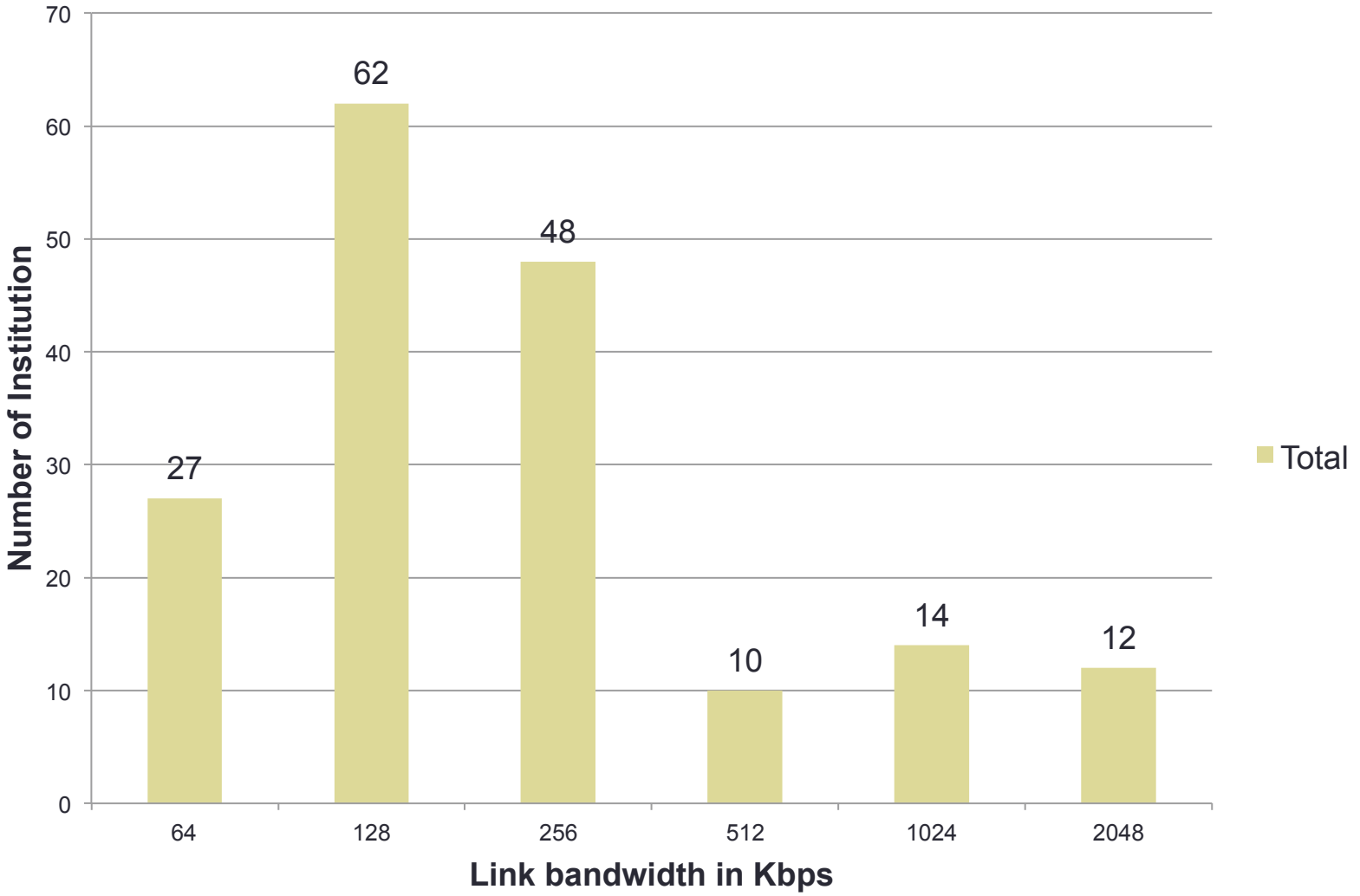
- Manages and maintains
  - Core networking infrastructure and Internet access (via LANs and dialup)
  - Internet services such as email, web access, remote access
  - Monitoring and Security Services
  - Host to Web sites and several national applications

- Started with a 256 Kbps in the core
- Became 4 Mbps in 2001
- Since December 2014, 10 Gbps
- We have authority over the rnu, rnrt, and turen domains

2004 Core topology



Réseau National Universitaire
Number of Links -- September 2005



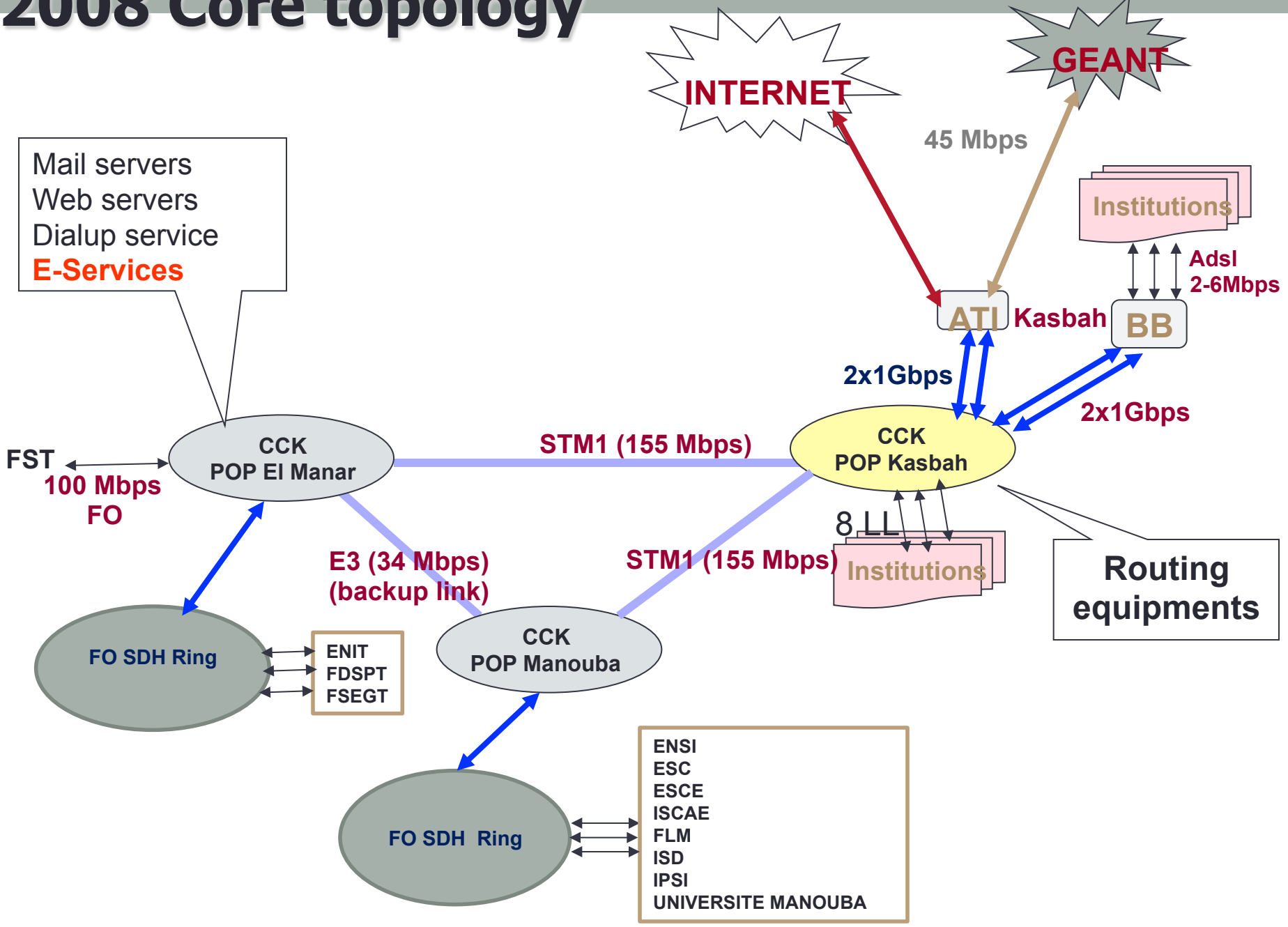
Then several upgrades…

- CCK infrastructure evolved with respect to
  - Size
  - Workload
  - Bandwidth
  - Services

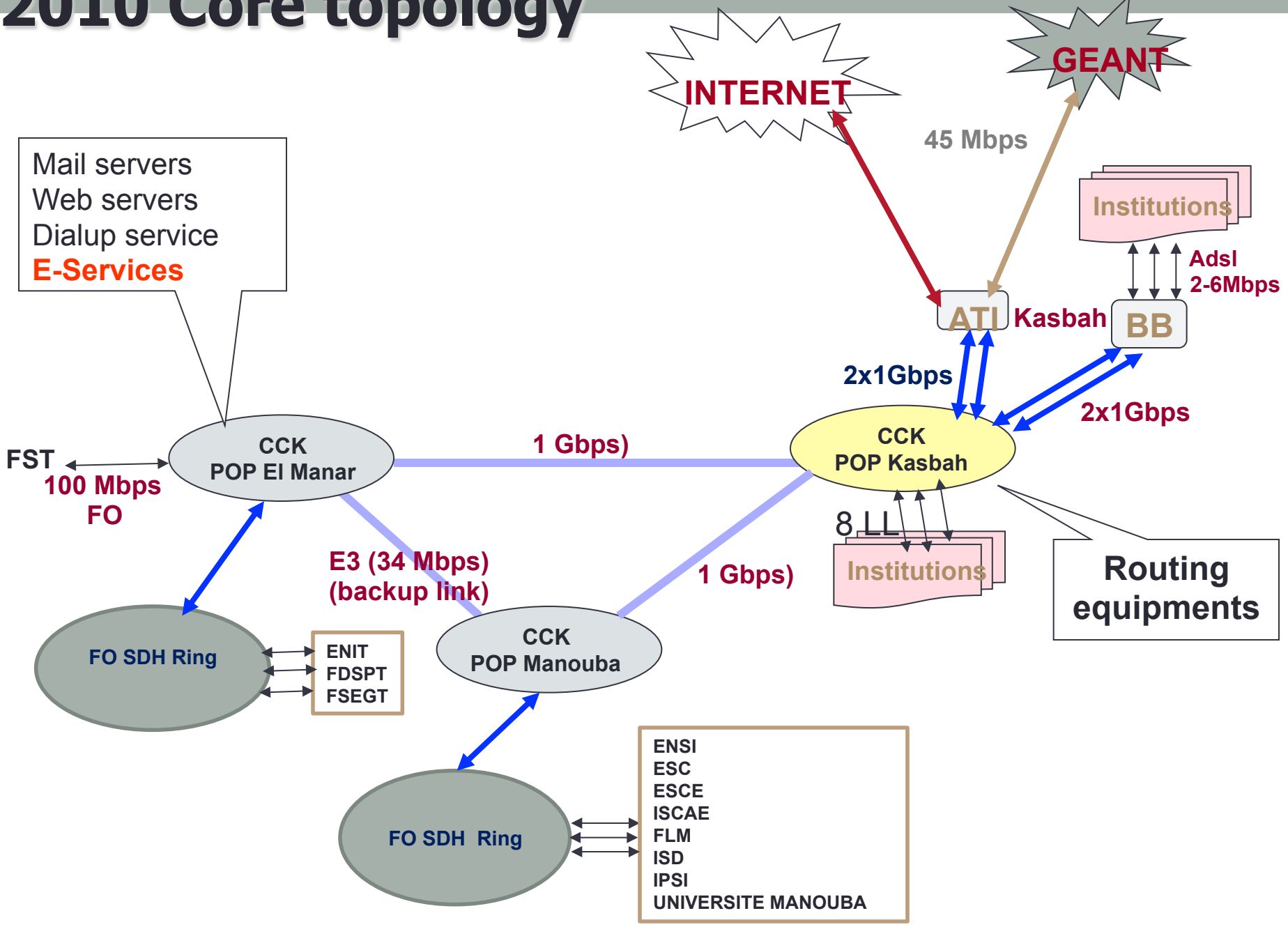
RNU 1st major upgrade

- Started October 2007: Agreement with Tunisie Telecom to implement:
  - 360 ADSL connections with bandwidth 2 Mbps to 6 Mbps
  - 5 x 10 Mbps Fiber Optic Connections
  - 2 STM1 (2 x 155Mb / s):
    - connecting the two PoPs, CCK-EL Manar and TT-Kasbah
    - connecting the two PoPs, CCK - Manouba and TT-Kasbah
  - E3 backup connection (34 Mbps) between CCK - Manar and CCK- Manouba

2008 Core topology



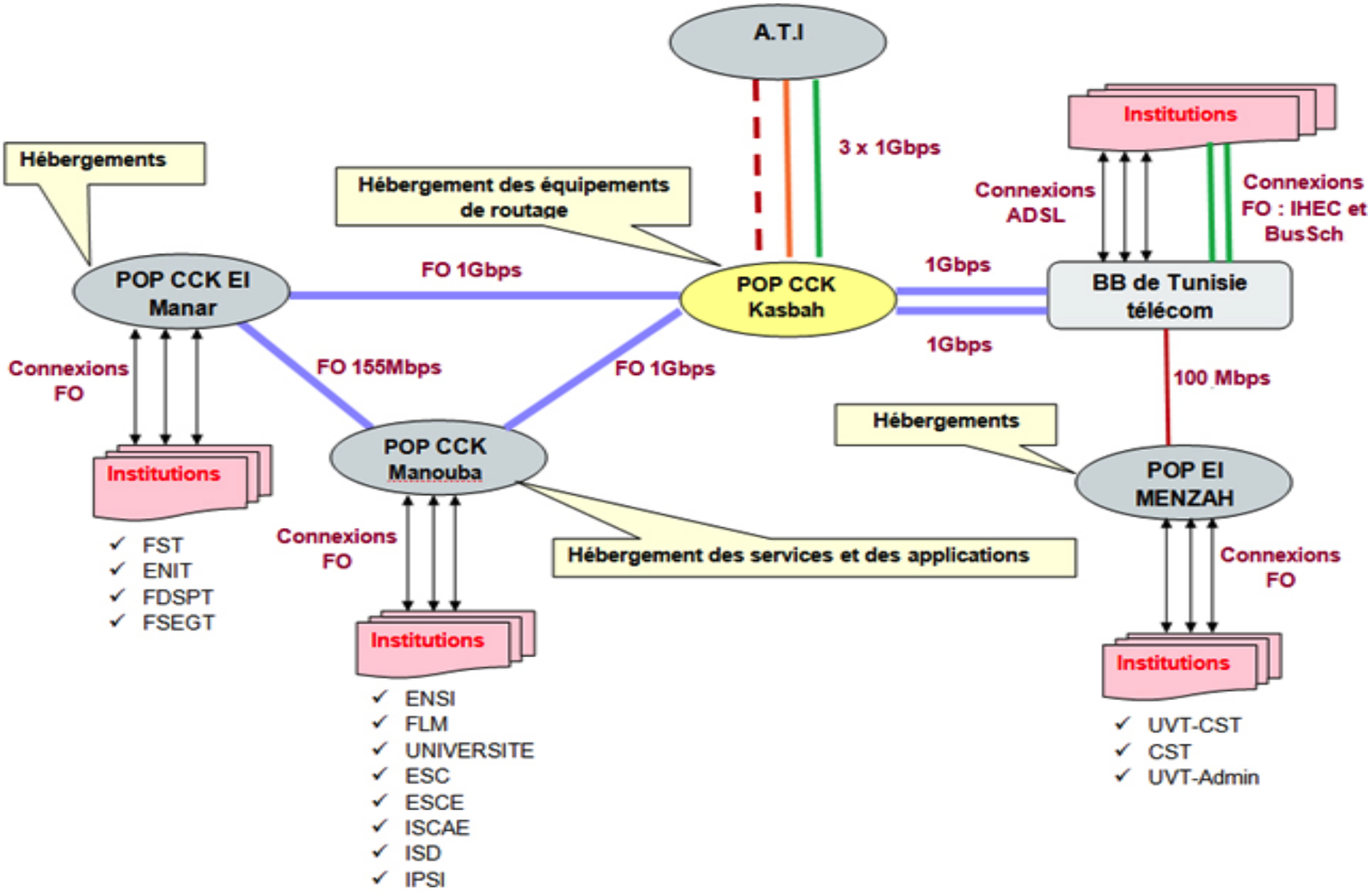
2010 Core topology



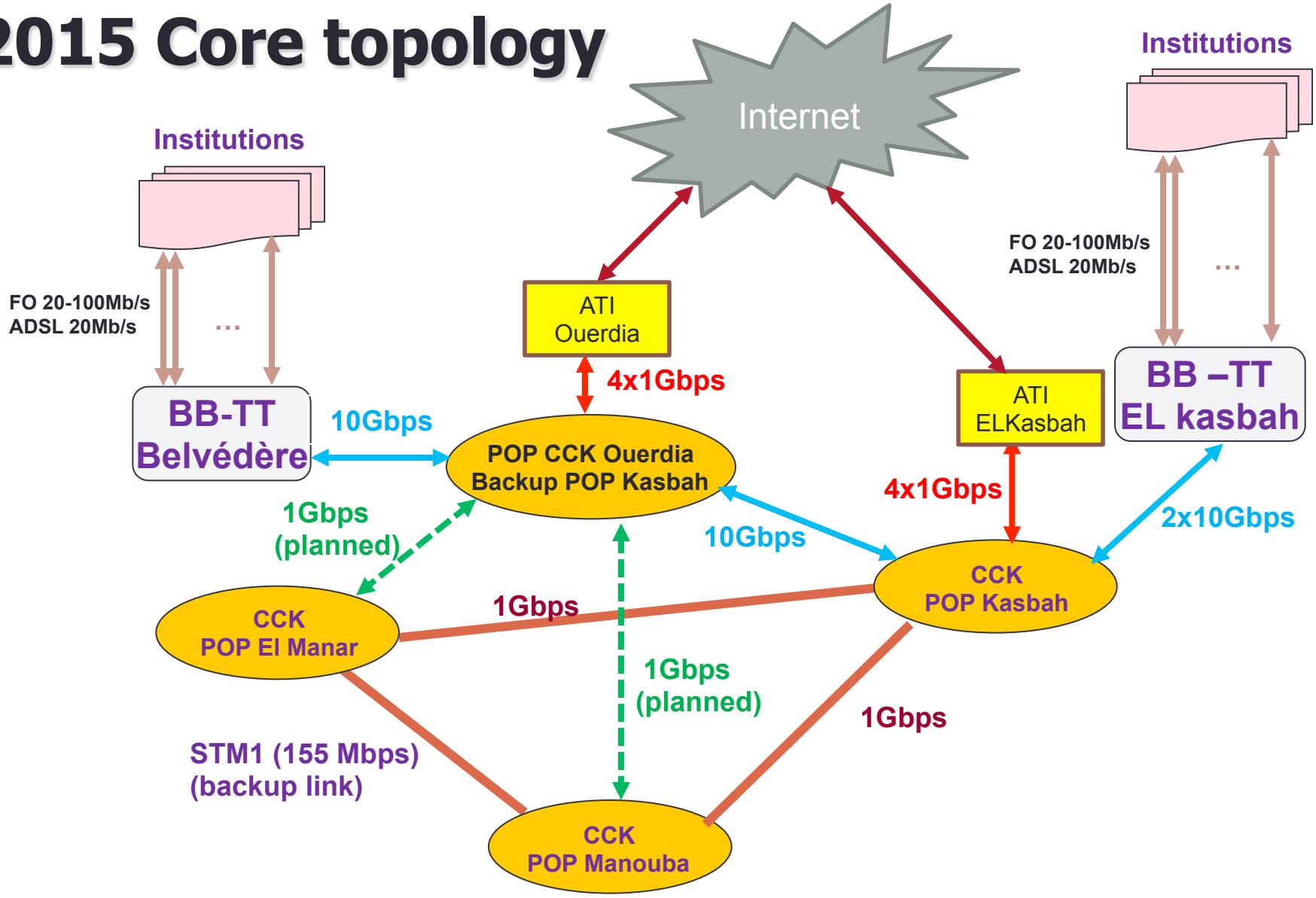
RNU 2nd major Upgrade

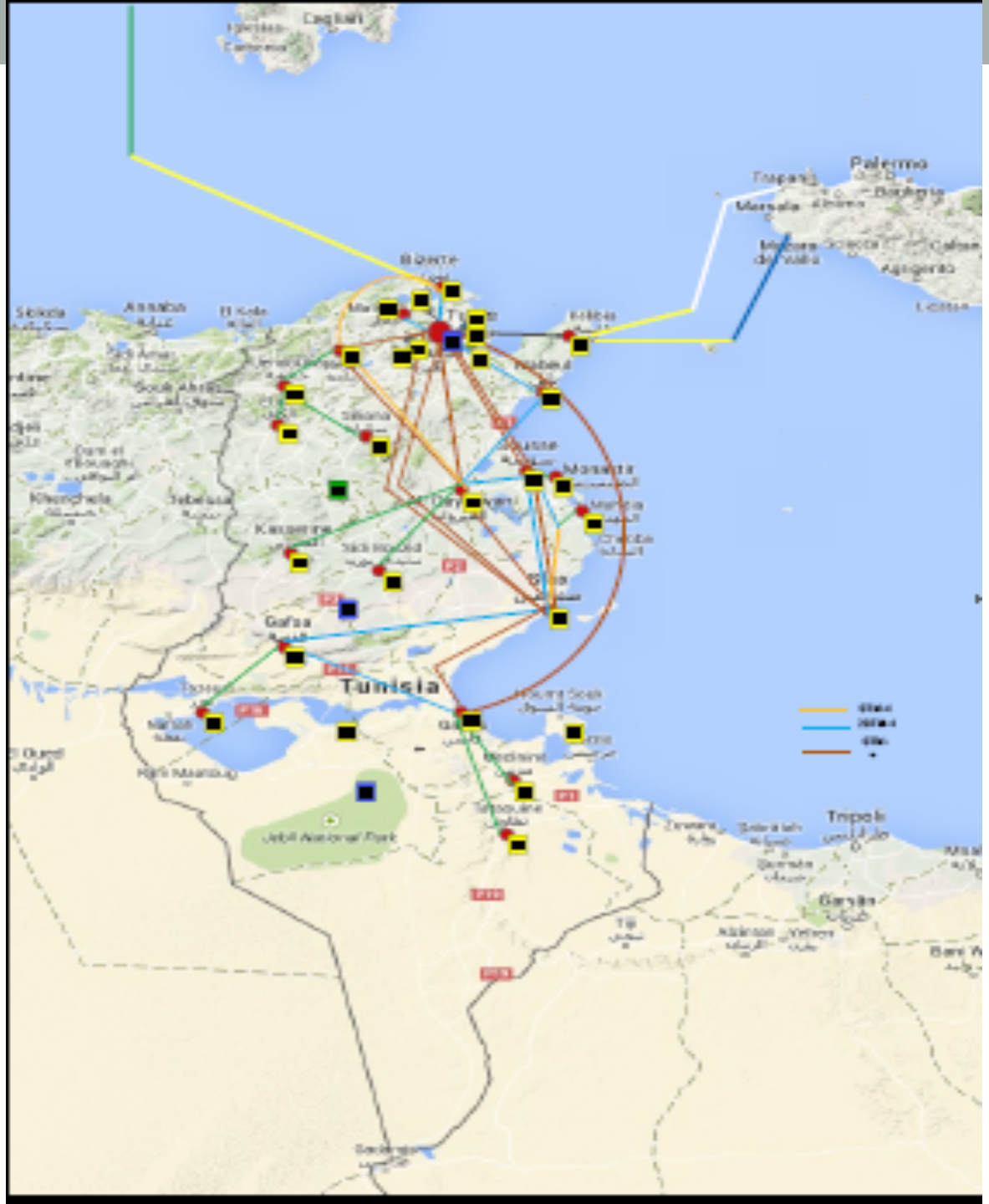
- September 2012, started another major upgrade:
  a) The deployment of 194 optical fiber connections with bandwidth varying between 20 and 100 Mbps.
  b) The deployment of 194 Corporate ADSL connections with bandwidth 20 Mbps.
  c) Upgrading of two connections (2x1 Gbps) connecting the CCK-Kasbah to TT-Backbone by two 2x10 Gbps connections.
  d) The establishment of a PoP at CCK EL Ouerdia, to serve as a rescue/ backup site for PoP EL Kasbah.

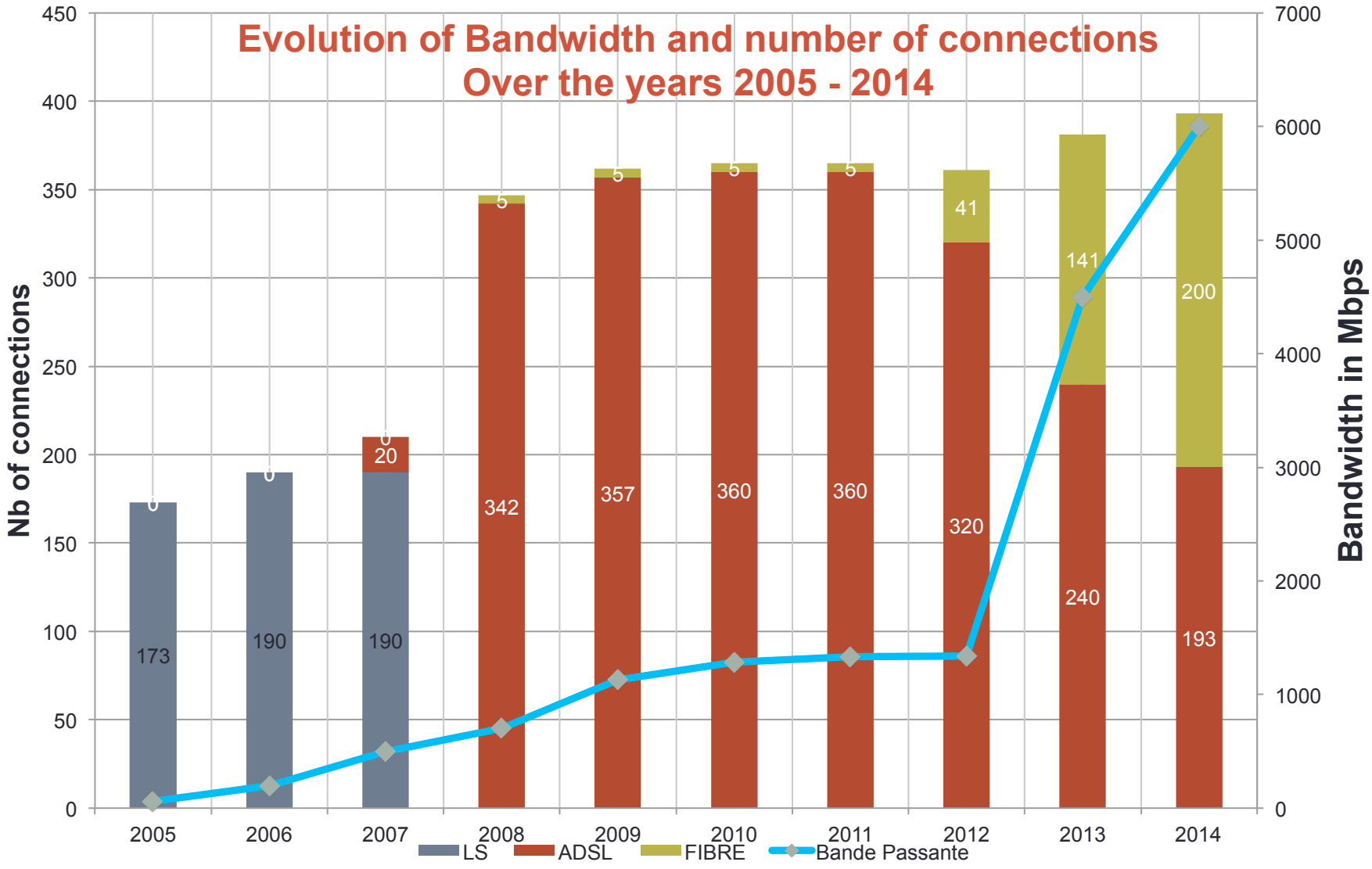
2013 Core topology



2015 Core topology




Palermo
Tunisia
Tripoli


Evolution of Bandwidth and number of connections
Over the years 2005 - 2014
Nb of connections
Bandwidth in Mbps
450
400
350
300
250
200
150
100
50
0
7000
6000
5000
4000
3000
2000
1000
0
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
0
173
0
190
0
20
190
5
342
5
357
5
360
5
360
41
320
141
240
200
193
LS
ADSL
FIBRE
Bande Passante

Servers and Storage resources

- Over a 100 rackable servers (about 200 processors with 4 cores per processor)
- Currently over 50 TB of storage

The network

- Connections:
  - Sites with FO access: 202
  - Sites with Corporate ADSL access : 200
    - Restaurants, dorms, transient locations

Networking Equipment

- Backbone
  - Switches
    - 3 core Huawei switches S7700 (1 Manar + 2 Manouba)
    - 20 Huawei switches S5700 (LAN Manar and Manouba)
  - Backbone Routers
    - 3 Huawei NE40E-X8 (Kasbah and Ouerdia)
- Access Routers
  - 150 Huawei AR2204 and 50 CISCO 2900
  - 200 CISCO 1900

Network and Security Management

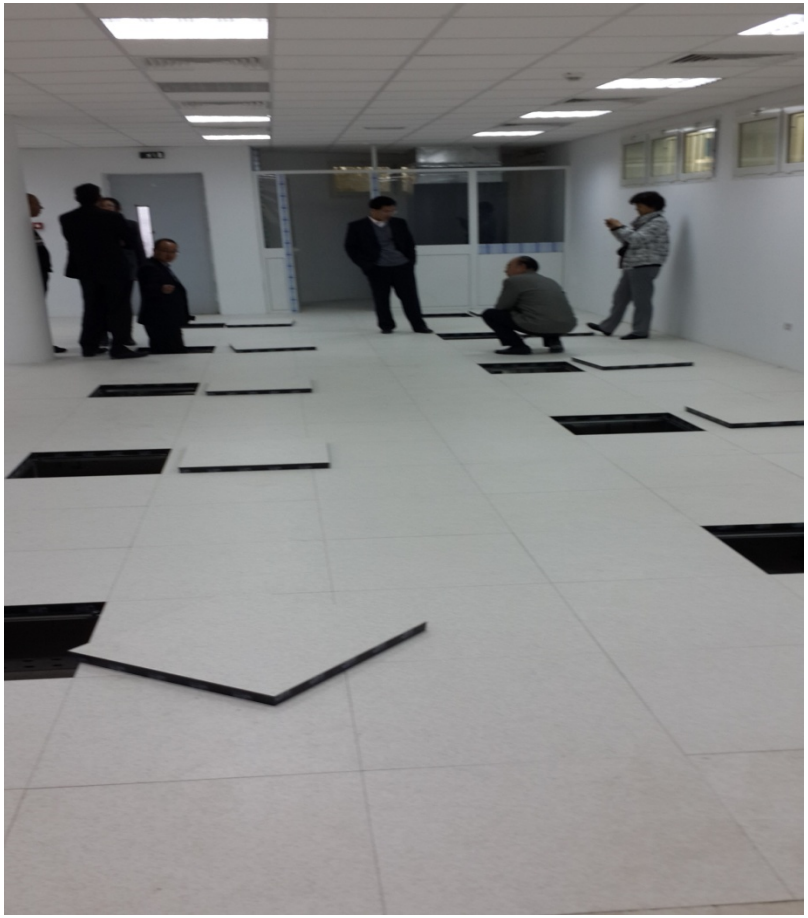
- Network
  - Network: eSight from Huawei
  - Remote Authentication Dial-In User Service (RADIUS)
    - 2 TSM Servers
- Security
  - NSM from Juniper
  - VPN-SSL stations, Firewalls, etc.

Projects: 2015+

- Put more fiber at the access networks
- Introduce agility in controlling bandwidth wrt needs
- Consolidate services through a well designed data center
  - Consolidate application servers, web servers, communication equipment, security systems, system administrators, support personnel, and anything that provides data services (Cloud services)
- Interconnect RNU to other NRENs (Eumedconnect3, Géant, Eduroam, ASREN, …)
- Partnerships with other NRENs and Data centers

Projects: 2015+

- Establish HPC center



Projects: 2015+

- Establish a NOC
  - Manage the network data center and provisioned services so that
    - QoS is acceptable
    - Troubleshooting is easier
    - Downtime is minimized
    - And the room infrastructure is efficiently operated
  - Monitor network traffic and servers workloads
- Deploy and use adequate mechanisms to understand current and future community needs.

Questions?