

Skills for IPv6

Public IPv6 training provider's testimonials

Florent NOLOT
University of Reims Champagne-Ardenne - France

Who am I ?

- ▶ PhD in Computer Sciences in 2003 at University of Picardie Jules Verne – Amiens
- ▶ Associate Professor since 2003 in Computer Sciences at University of Reims Champagne-Ardenne
 - ▶ Specialized in Linux system administration and networks
- ▶ Created a Cisco Networking Academy in 2007
- ▶ In charge of a Master in System administration and network security
- ▶ Research in ad-hoc networks and network security

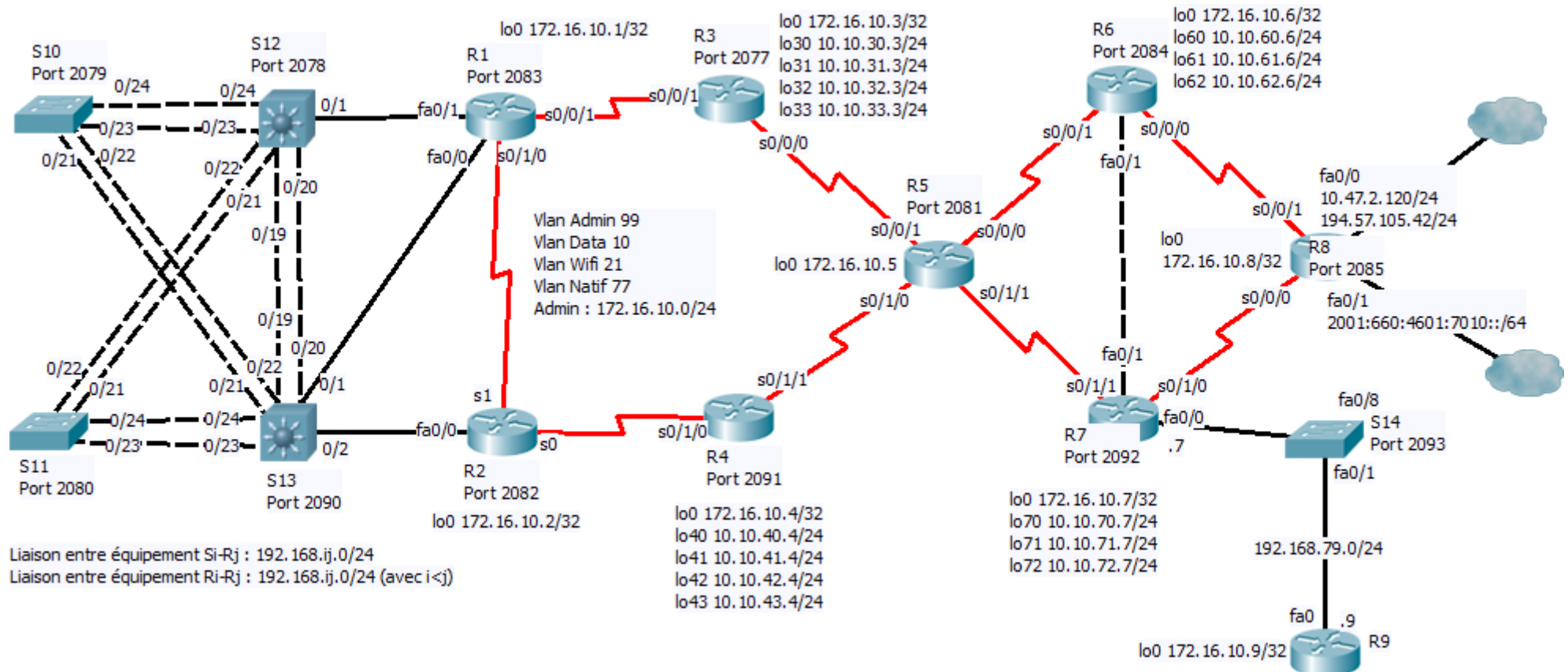


My little IPv6 history

- ▶ Starting in 2001 in University of Littoral Cote d'Opale at Calais
 - ▶ Only some courses only on the protocol but no practice
 - ▶ Systems were not compatibles
 - ▶ Since 2006, in University of Reims Champagne-Ardenne
 - ▶ Buy some equipments, realize some simple labs
 - ▶ I invited Guillaume VALADON, co-authors of Scapy v6 to make some labs in Reims
- BUT
- ▶ We need to have IPv6 Internet connection !
 - ▶ Since 2006
 - ▶ Only network administrator of my university used IPv6 for testing only
- AND
- ▶ Me for the courses and practice labs

Network topology example

- ▶ Today, our network lab for the student :
 - ▶ 1 Cisco 6509, 18 routers, 15 switches and 2 firewalls ASA 5510
 - ▶ One public IPv4 address and one IPv6 address connected to IPv6 service of RENATER



Our actions for IPv6 training

- ▶ From 2008, in undergraduate to graduate courses, I have included IPv6
 - ▶ Every student in Computer Sciences have knowledge on IPv6
- ▶ With a former Master student, we develop a new Web based solution for blended distance learning
 - ▶ Control (configure) physical network equipment (routers, switches, firewalls, PC)
 - ▶ Control virtual PC
 - ▶ With a web navigator
- ▶ Our goal : develop many IPv4/IPv6 labs for public access to present migration solution but we need funds to finish the project !

Skills for IPv6

Difficulties to teach IPv6 today
My answers

Some problems with IPv6 today

- ▶ Some softwares block IPv6 traffic !

Example : Add rule to authorize IPv6 traffic on Symantec Endpoint Protection Software

- ▶ Not all web hosting company offers IPv6 connexion
- ▶ Need to duplicate all security rules for IPv4 and IPv6
 - ▶ On Linux, you need to use iptables and ip6tables
- ▶ Need to change VPN concentrator to support IPv6
- ▶ Need to have IPv6 connectivity
 - ▶ In France, RENATER offer this service - but not in dual stack configuration
 - ▶ Is IPv6 offered by every academics and private operators ? Not yet

Some company testimonials

- ▶ I make more than 20 visits per year when my students are in company
- ▶ Since 2 years, I ask the following question

Do you think or do you have some projects on IPv6 ?

The answer is always the same

No, not yet but

Why migrate my network to IPv6 ?

Can I earn more money with IPv6 ?

- ▶ Only one big French company in IT services, last year, had one demand from one of their clients for IPv6
 - ▶ WHY ?
 - ▶ To use Microsoft Direct Access which works with IPv6 native

Questions for future ?

- ▶ Why not to force operator to offer IPv6 ?
 - ▶ It's the first requirement !
- ▶ All companies ask the following question
 - ▶ Without NAT, how can I secured my desktop ?
 - ▶ Need to train manager, users ... but who will train every body ?
 - ▶ IPv6 Forum education program is a very good initiative
- ▶ For public services, we need time to migrate to IPv6
 - ▶ Some others projects is more important like ToIP (business impact), supervision, ...
 - ▶ Example : in Reims, only 3 networks administrator for more than 800 active devices !
- ▶ To convince company to migrate to IPv6, we need to answer the following question

What is the business advantage to migrate to IPv6 ?

My IPv4 network works, so why I would change it ?

Skills for IPv6

Thanks