Yesser IPv6 Deployment Plan(update)

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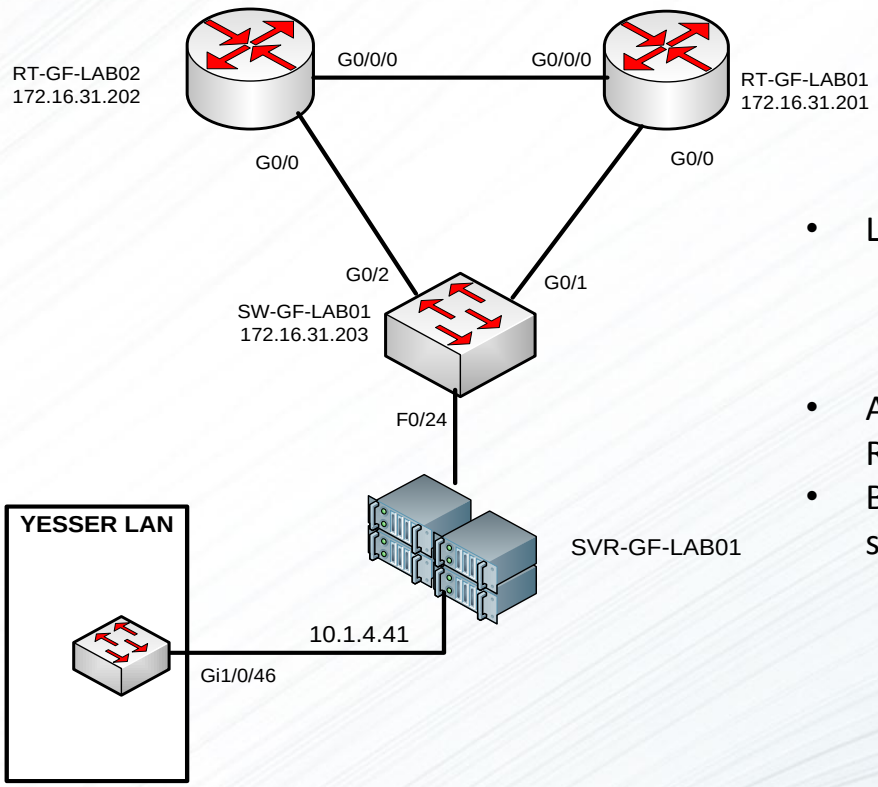
Project Phases:

1st Phase	Build IPv6 Lab	• Complete IPv6 Lab and testing scenarios • Peer with external parties (CITC /other tunnel porkers) • Training plan for the team
2ndPhase	Build IPv6 Internet gateway	• Connect to internet through IPv6 link • Publish the public services hosted at e-Gov DC using IPv6: ▪ www.yesser.gov.sa ▪ www.saudi.gov.sa
3th Phase	IPv6 e-Gov DC Infrastructure	• Identify all Network & security devices requiring IPv6 support. • Identify all systems and applications. • Ensure that network and application performance will Not affected. • Upgrade Network & security active component • Migrate & connect new services to IPv6
4th Phase	IPv6 e-Government gateway	• Support other government agencies to publish their Public services using IPv6

1st Phase

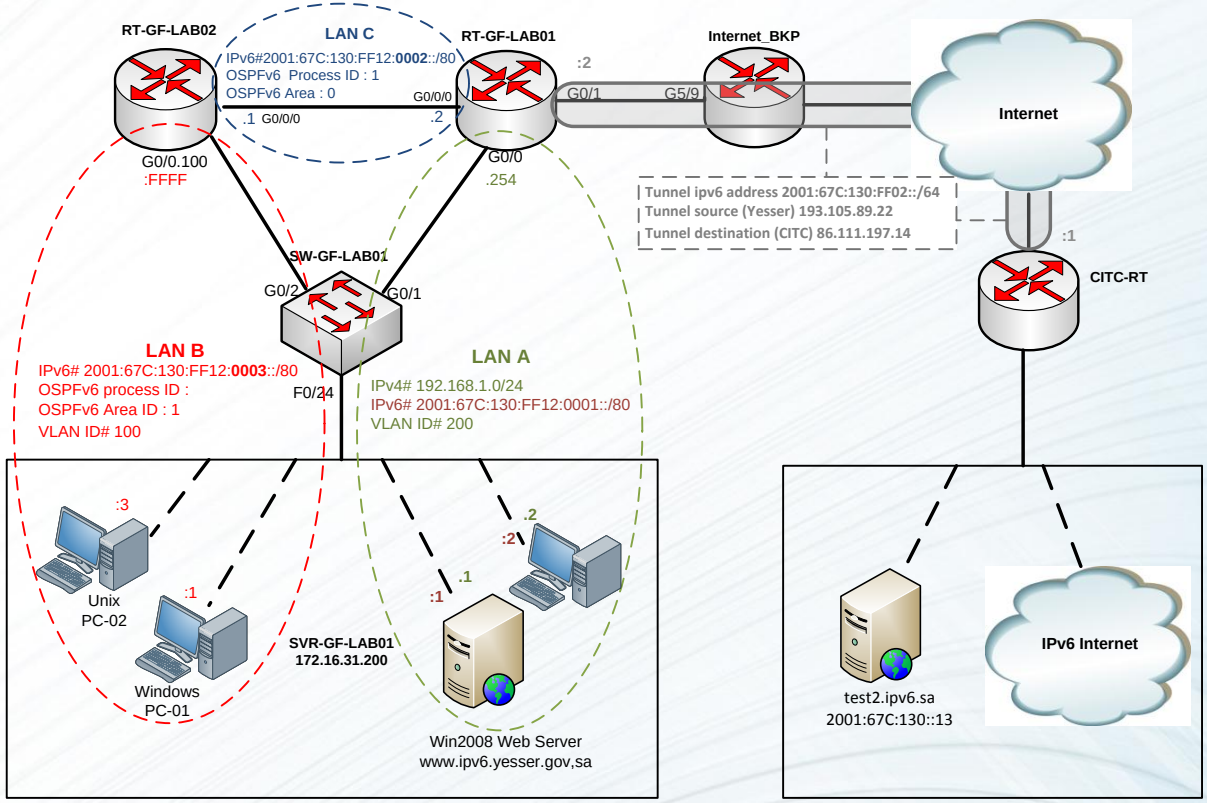
LAB physical connectivity Diagram



- LAB components:
  - ✓ 2x routers
  - ✓ 1x switch
  - ✓ 1xVmware server
- All IPv6 tests (Tunneling, NAT-PT, Native IPv6, Dual Stack, Routing protocols, etc.) are simulated on the LAB.
- Building LAB at 1st phase was very important to test all scenarios before moving to production.

1st Phase

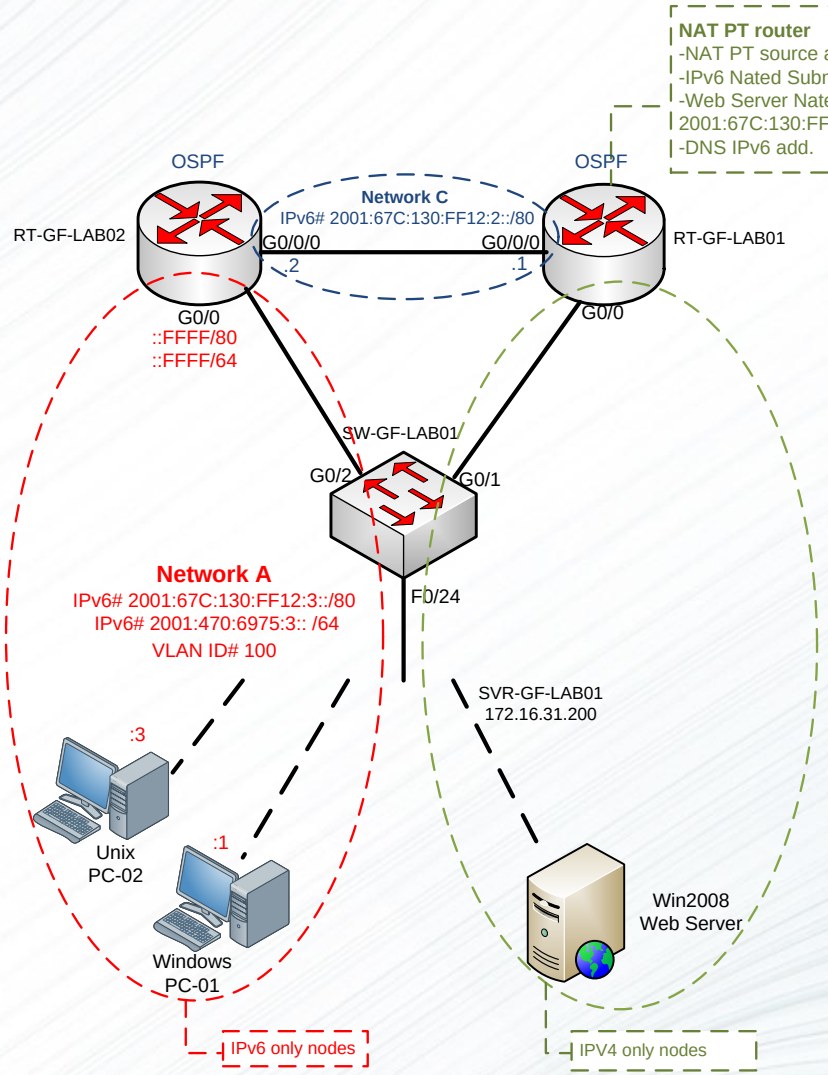
Peering with CITC and other Tunnel brokers



- IPv6 over IPv4 tunnel with CITC (router to router):
  - No dedicated link is needed, just internet connectivity.
  - Test CITC IPv6 offered services (Web, DNS, etc.)
  - Assigned a dedicated IPv6 subnet: 2001:67C:130:FF12::/64 for Yesser own use

1st Phase

Network Address Translation - Protocol Translation



	IPV6 nodes		IPv6 nodes as seen by IPv4 network	IPv4
V6V4	Win PC-1	FD00:0:0:1::1/64	===> will be seen as	192.168.2.101
	Unix PC-2	FD00:0:0:1::3/64	===> will be seen as	192.168.2.101

	IPV4 nodes		IPv4 nodes as seen by IPv6 network	IPv6
V4V6	Web server	192.168.1.1/24	===> will be seen as	FD00:0:0:3::1/64

- Currently dual Stack is not supported:
  - Some of the Network/security devices are not IPv6 capable
  - System level assessment is not ready
- Nating technique is used generally for communication between IPv6 and IPv4 networks.
- The Nating device resides at the boundary between an IPv6 and IPv4 network for translation.
- The test was successful in the LAB but we faced performance issues in production while Nating on the Edge Router and internet Firewall.
- Later on the translation was moved to the Load Balancer and was successful.

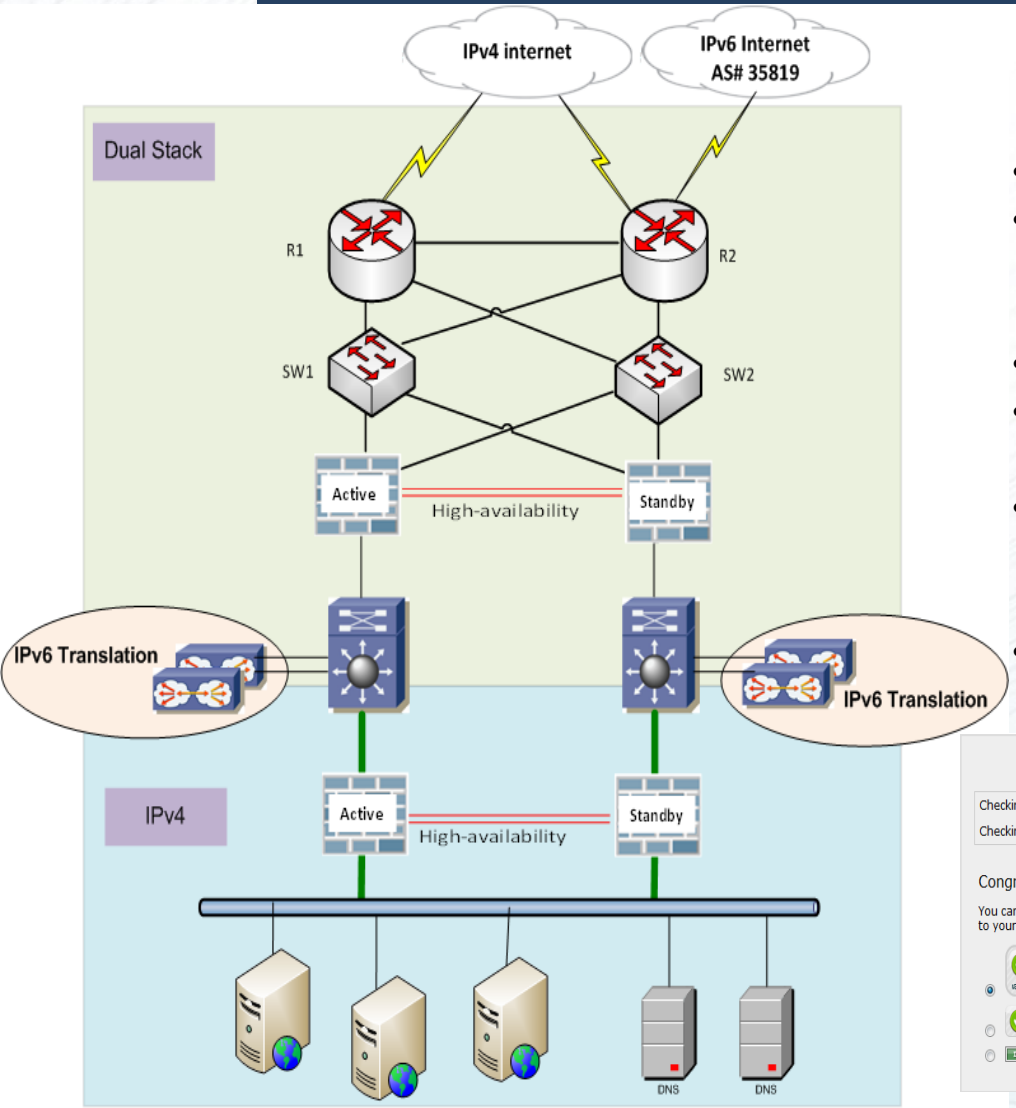
1st Phase

LAB benefits

1. Simulating IPv6 migration scenarios from IPv4 to IPv6
2. Identify and log the issues faced during the tests
3. Build a good knowledge for the team to understand the IPv6 implementation and challenges
4. Improve the awareness and brainstorm on IPv6 migration requirements and options
5. Understand the IPv6 IP addressing design

2nd Phase

How Yesser hosted services are published?



- IPv6 internet link through Mobily.
- Since all devices are not capable of IPv6, so translation between IPv6 and IPv4 is performed on the Load Balancer.
- Load Balancer acts as an IPv6 to IPv4 gateway.
- Configure a virtual server using IPv6 and pool members still IPv4.
- Connections to an IPv6 virtual server that are forwarded to an IPv4 destination will be translated to the IPv4 self IP address of the destination VLAN.
- DNS is also published to support requests from other native IPv6 DNS.

3rd Phase

IPv6 Network/ security Readiness Assessment summary

Capability	Definition	% of Devices
IPv6 Capable	Devices have been deemed capable of providing the required IPv6 features to implement the desired IPv6 services	38.1 %
Not Capable	Devices are not capable of supporting IPv6.	23.8 %
The device needs an IOS upgrade only	An IOS upgrade is required to support the feature capabilities selected for this group of devices	38.1 %
The device needs an IOS upgrade and a FLASH memory upgrade	An IOS upgrade and FLASH memory upgrade is required to support the feature capabilities selected for this group of devices	0.0%
The device needs an IOS upgrade and a DRAM memory upgrade	An IOS upgrade and a DRAM upgrades required to support the feature capabilities selected for this group of devices	0.0%
The device needs and IOS upgrade and both FLASH and DRAM memory upgrades	An IOS upgrade and a memory upgrade, both FLASH and DRAM is required to support the feature capabilities selected for this group of devices	0.0%

3rd & 4th Phase

Planned activity

1. Another IPv6 link from KACST(**In progress**).
2. Dual stack on the user Vlans(**In progress)**.
3. Identify all systems and applications.
4. Upgrade Network/security active components.
5. Migrate & connect new services to IPv6.

Thanks

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