

هيئة الاتصالات وتقنية المعلومات
Communications and Information Technology Commission



IPv6 PROMOTION AND DEPLOYMENT IN SAUDI ARABIA

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March, 2014
MENO14, Dubai UAE

AGENDA

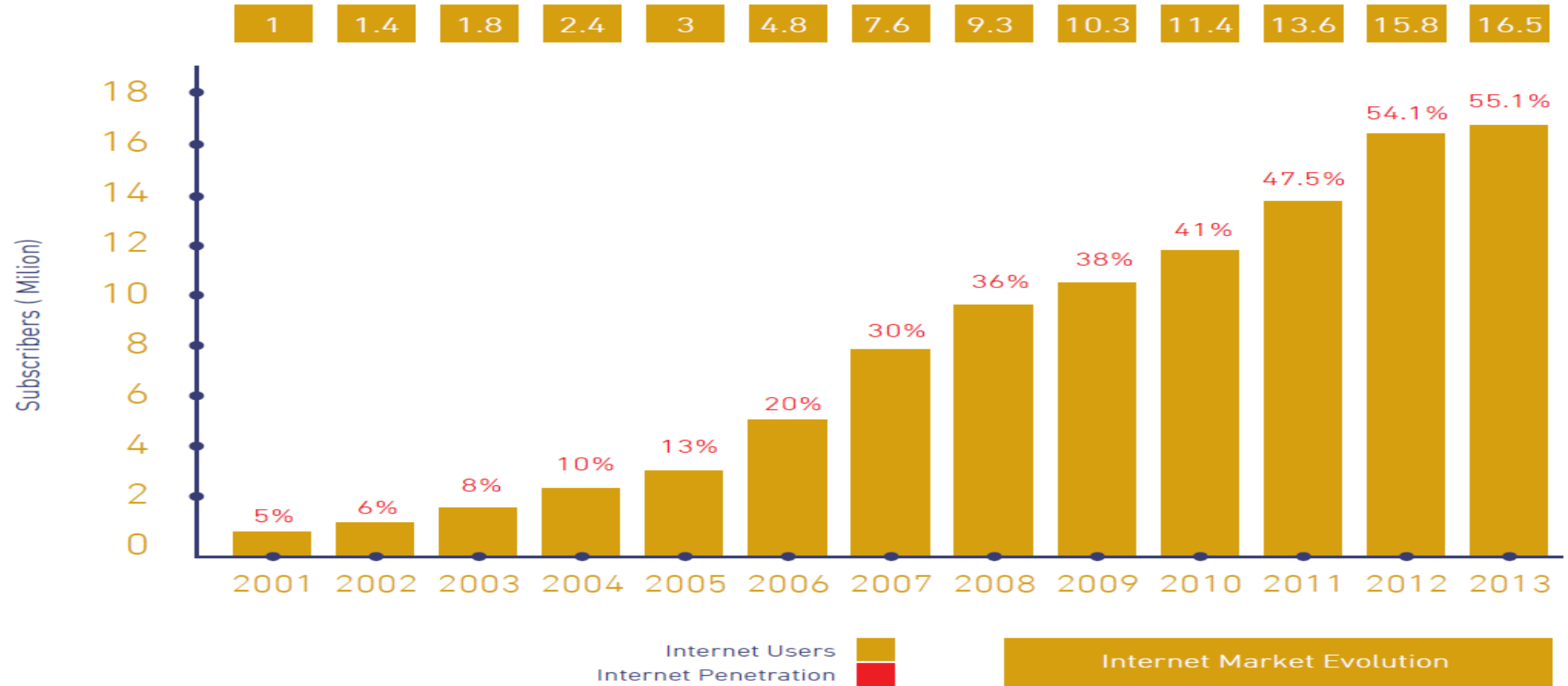
- Background
- IPv6 in Saudi Arabia
- IPv6 Survey
- Next Steps



BACKGROUND



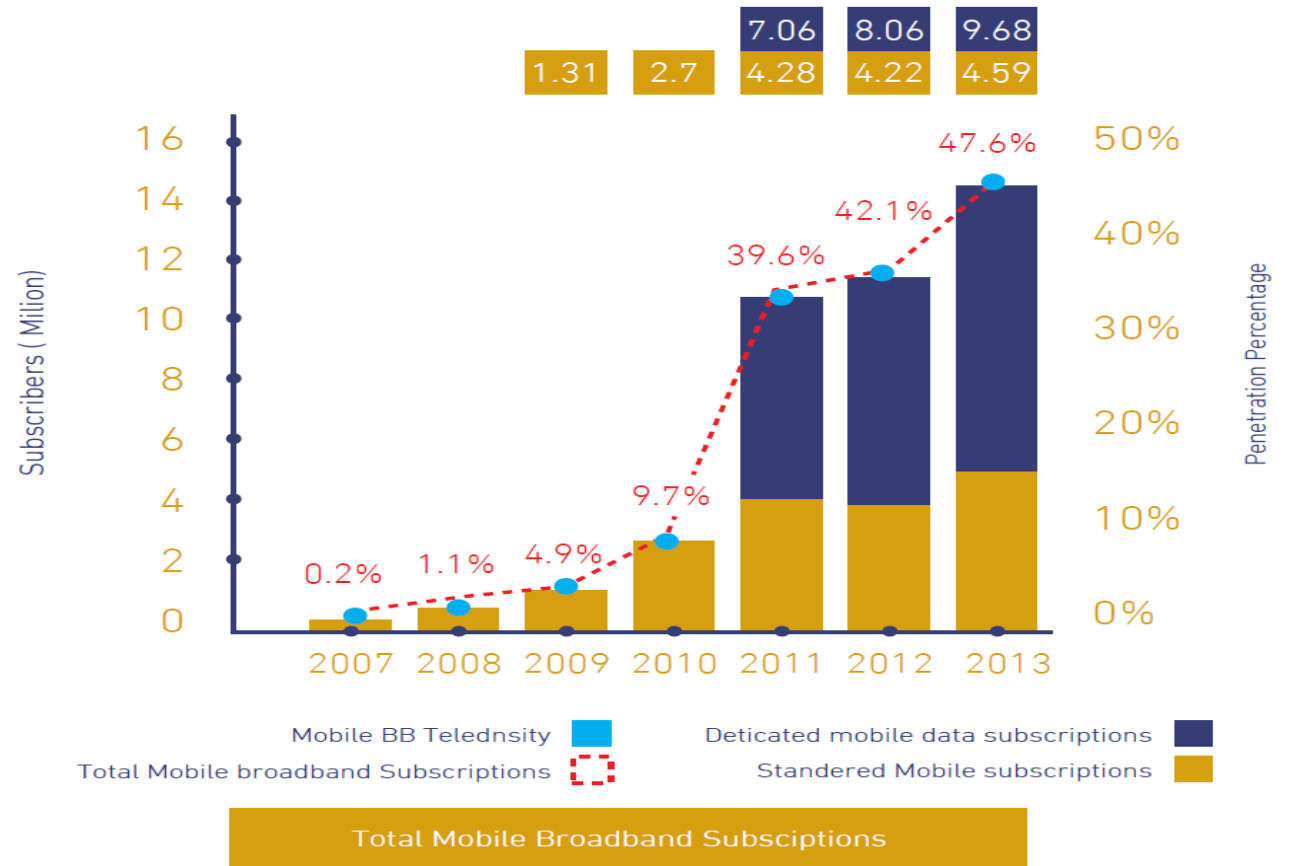
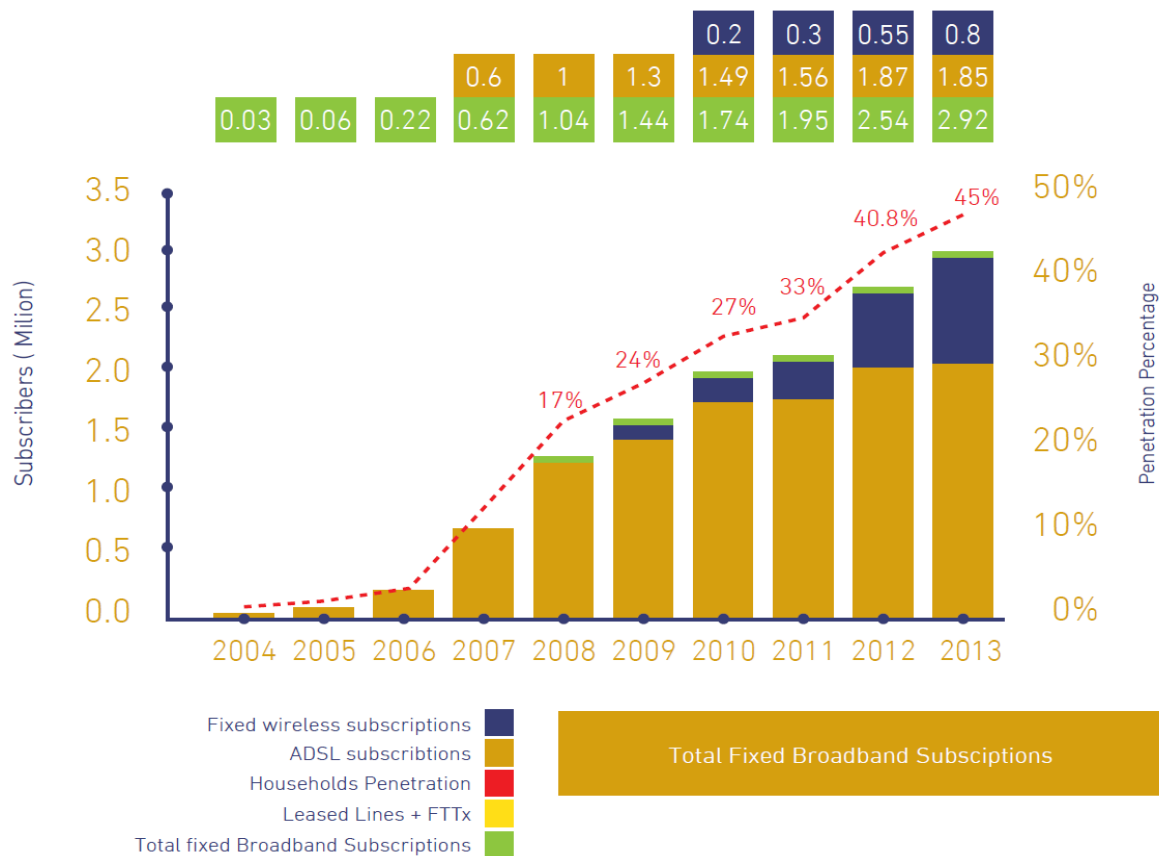
INTERNET GROWTH



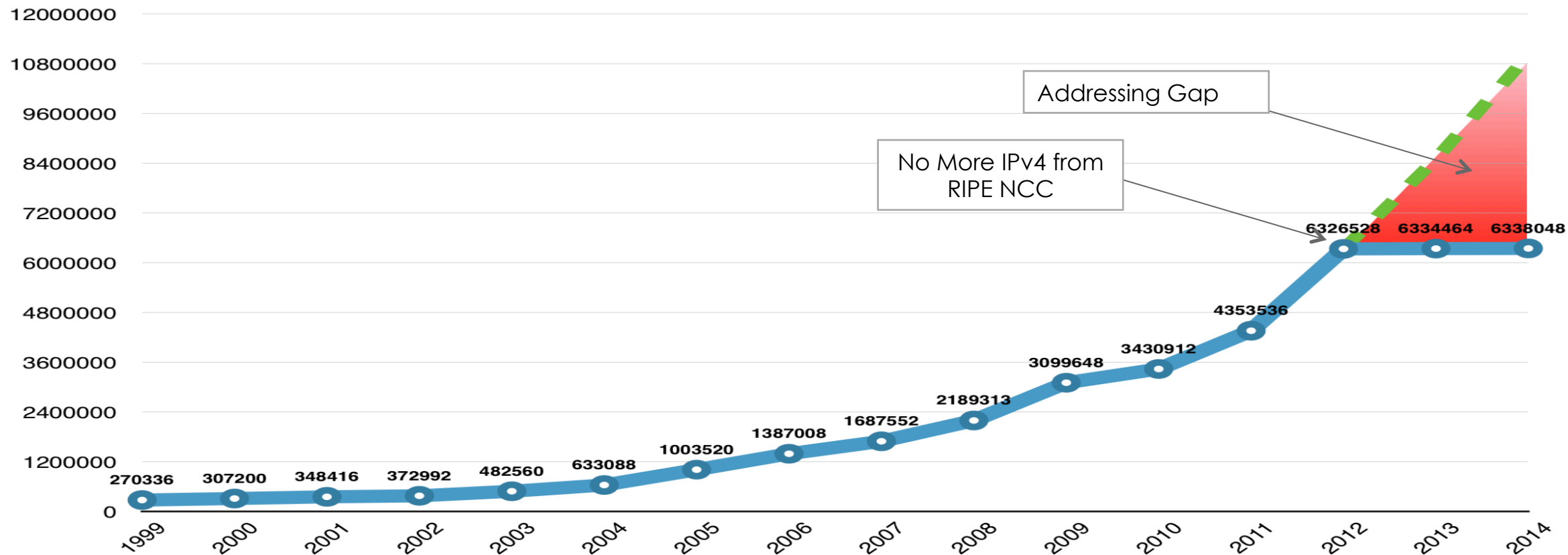
Increased Internet broadband usage in KSA through 2004-2013, hence demanding more IP addresses



BROADBAND MARKET EVOLUTION



IPv4 IN SAUDI ARABIA

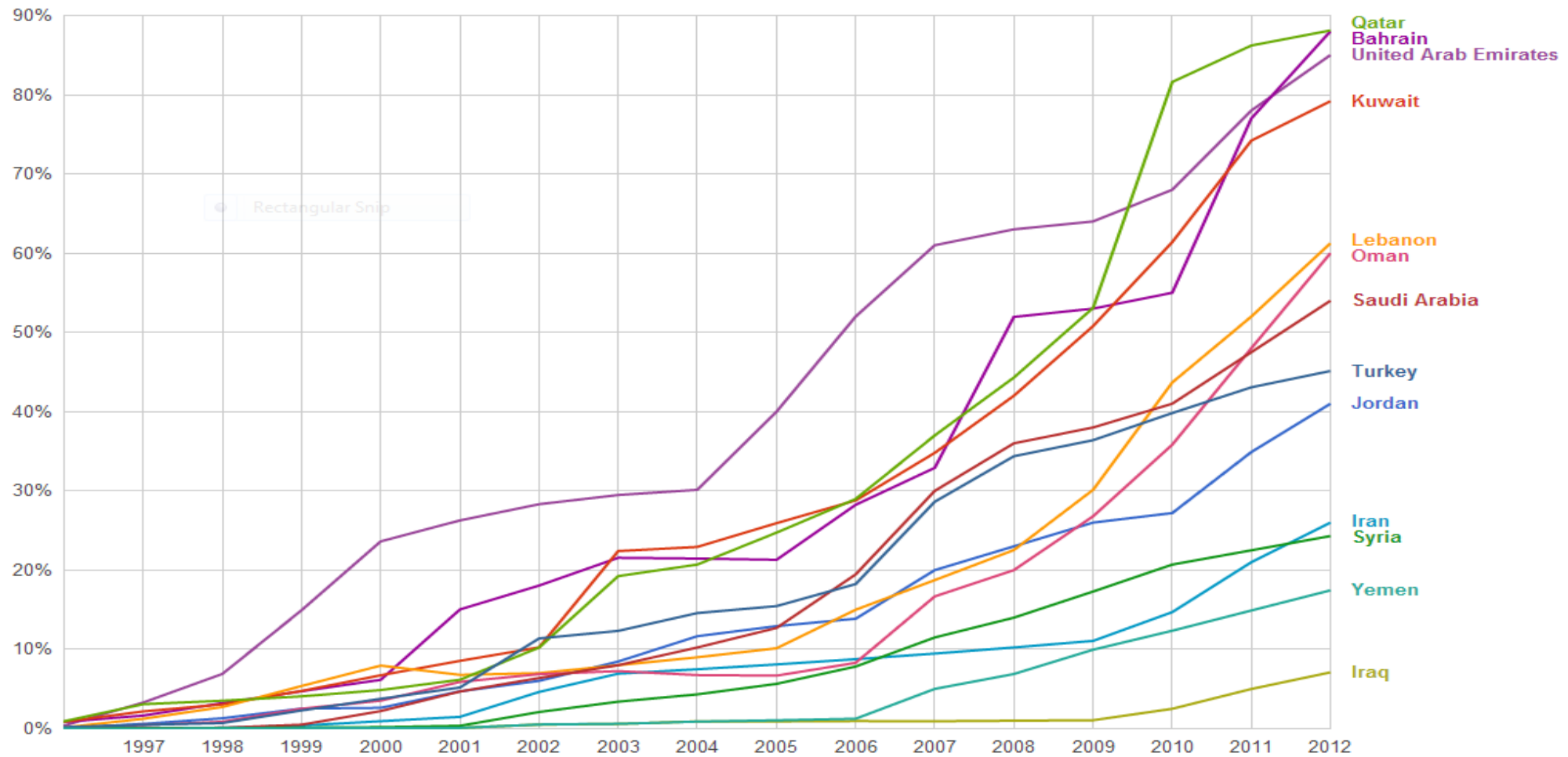


- 6.47 Million IPv4 Addresses
- 94.35% Advertised
- 0.440 IPv4 Address Per Internet User

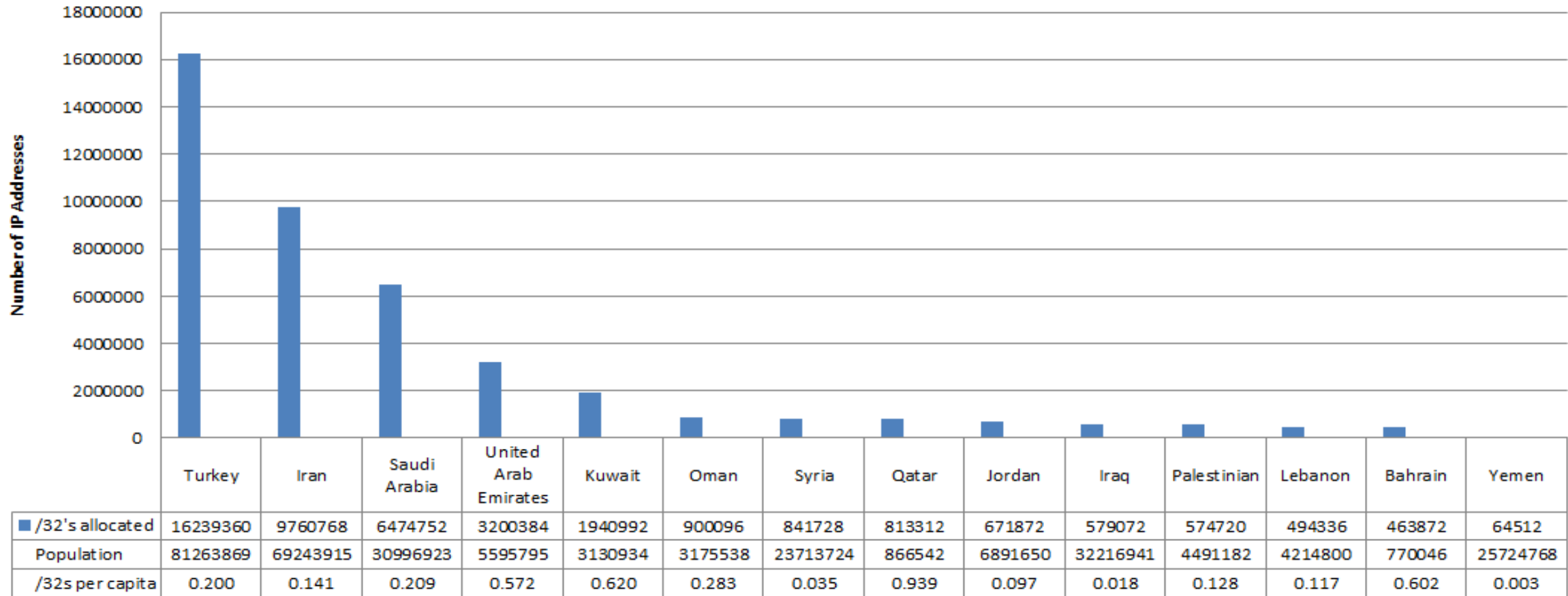
(Source: <http://resources.potaroo.net/iso3166/v4cc.html>)



INTERNET PENETRATION IN THE REGION



IPv4 Status (MENOG Region)



(Source: <http://resources.potaroo.net/iso3166/v4cc.html>)



BRIDGING THE GAP

- There are approaches (CG-NAT, NAT) to bridge this gap with current IPv4 based technologies
- This has several important drawbacks:
 - Security issues (Overblocking, Identification)
 - Complications for Law enforcement (Forensics, logs)
 - Increased cost (double NAT, CGN equipment cost)
 - Limited scalability (breaking web applications)
- This is not sustainable
- Today IPv6 is the only internationally accepted solution



IPV6 IN SAUDI ARABIA



OBJECTIVES & STRATEGY TRACKS

- **Mid 2007:** CITC started efforts for promoting adoption of IPv6.
- **Main Objective:** Ensure the continuous development of the Internet in the country

Strategy Objectives

- Prepare for the IPv4 exhaustion by supporting IPv6 and ensure stability, business continuity and room for continued growth of the internet in Saudi Arabia
- Smooth adaption of IPv6 by stakeholders and minimize risks
- Raise overall IPv6 awareness nationwide by approaching stakeholders of both the public and private sectors highlighting the necessecity to adopt IPv6

Strategy Tracks

Infrastructure

- 5 Initiatives:
 - IPv6 Addressing
 - IPv6 Commercial Support for Nation Wide Infrastructure
 - .SA ccTLD IPv6 Compliance
 - IPv6 Compliant Internet Filtering
 - IPv6 Lab

Awareness

- 5 Initiatives:
 - IPv6 Task Force
 - Outreach Activities
 - International Cooperation
 - IPv6 Training
 - IPv6 Compliant Procurement



STAKEHOLDERS

- ✓ Collaborative effort
 - ✓ National and International participation
 - ✓ Service Providers
 - ✓ Government Agencies
 - ✓ Vendors
 - ✓ Major Banks
 - ✓ Enterprises !!!
 - ✓ Universities

- ✓ Thanks to RIPE and MENOG



PREVIOUS IPV6 ACTIVITIES

- Task Force meetings
 - ✓ Kick-off meeting of the National IPv6 Task Force (July 30, 2008)
 - ✓ 14 meetings have been conducted (hosted by different members)
 - ✓ Last meeting conducted on November 2013
 - ✓ Next meeting will be conducted on May 2014

- IPv6 Training
 - ✓ IPv6 Training by CITC (three sessions)
 - ✓ IPv6 Road Show was organized Six times. Thanks to MENOG and RIPE
 - ✓ Next IPv6 Road Show training will be conducted in parallel with Task force meetings on May 2014

- IPv6 Conferences
 - ✓ Two IPv6 National Conferences were organized (2009 and 2011) with around 500 attendees
 - ✓ The third Conferences will be conducted on Q2 2015



KEY ACHIEVEMENTS

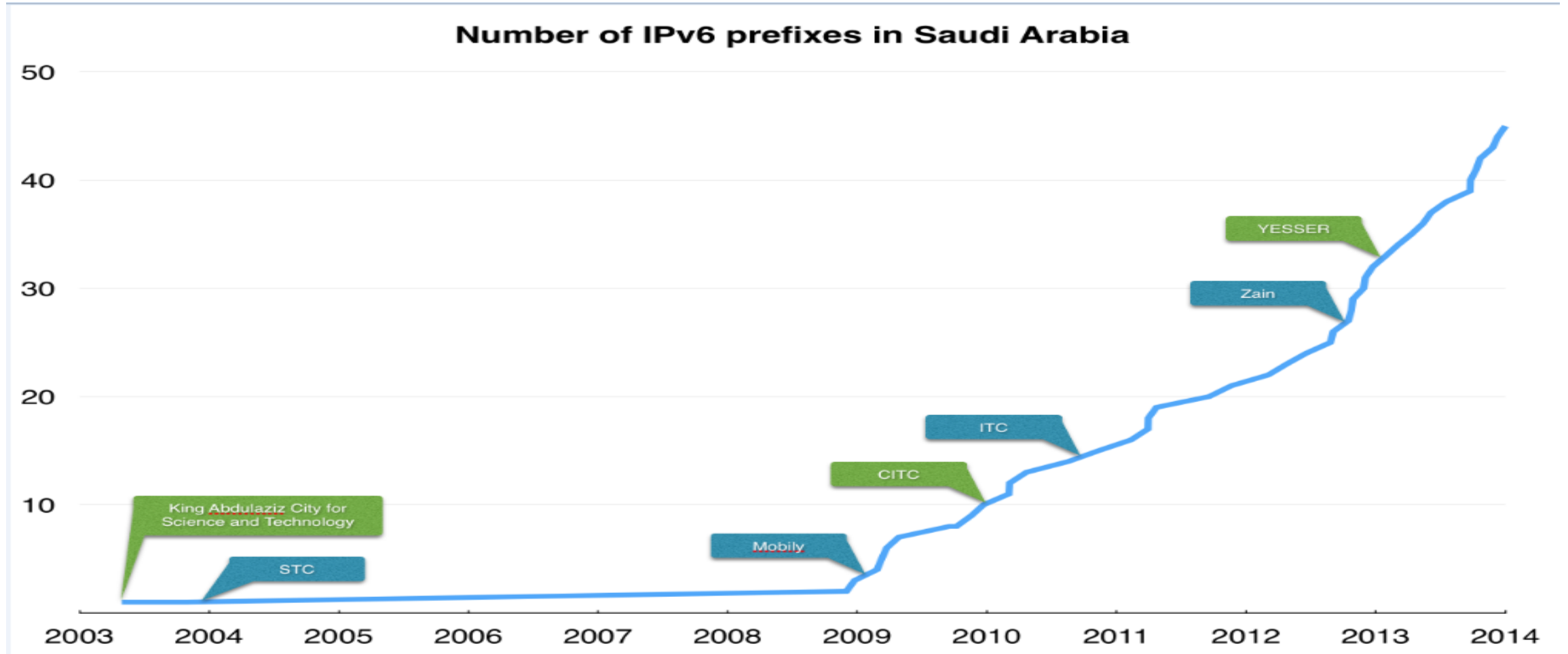
- ✓ Number of the Saudi entities that have IPv6 address space increased from 2 in 2008 to 50 today.
- ✓ Some entities have started to provide their services through IPv6.
- ✓ Most of the Saudi Banks got their own IPv6 addresses.
- ✓ IPv6 test lab was built by CITC, and it is available for members.
- ✓ The Saudi DNS root server (.sa ccTLD) is IPv6 ready.
- ✓ Tunnel Broker was built by CITC to offer IPv6 connectivity for any internet user in Saudi Arabia.



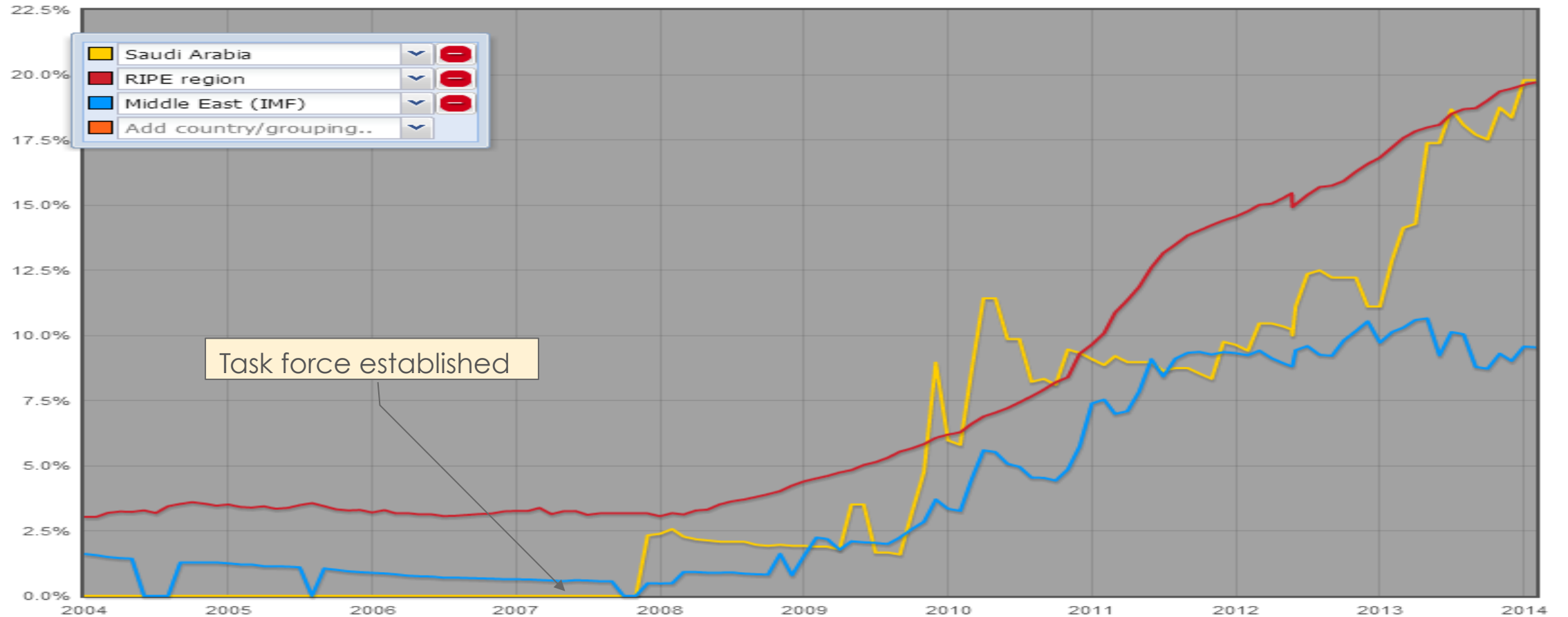
#	Prefix	Owner	Allocated	First seen	#	Prefix	Owner	Allocated	First seen
1	2001:1490::/32	ISU, KACST	20-06-2003	14-11-2007	27	2a00:d7c0::/32	BANK AL JAZIRA	10-04-2012	-
2	2001:16a0::/29	SaudiNet, STC	19-12-2003	-	28	2001:67c:2994::/48	Al-Imam Muhammad Ibn Saud University	31-05-2012	-
3	2001:16a0::/32	SaudiNet, STC	19-12-2003	10-02-2010	29	2001:67c:3e8::/47	Bank Al Bilad	25-07-2012	-
4	2a02:888::/32	Atheeb Trading Co Ltd.	12-01-2009	30-11-2011	30	2a02:cb80::/29	MTC KSA	01-10-2012	-
5	2a02:9b0::/32	Ettihad Etisalat	04-02-2009	01-04-2009	31	2001:67c:12e4::/48	Arab National Bank Saudi Stock Co.	09-10-2012	-
6	2a02:ce0::/32	Bayanat Al-Oula	08-04-2009	09-04-2009	32	2a02:e220::/30	Prime Technology Company LLC	20-11-2012	-
7	2a02:d70::/32	Sahara Network	21-04-2009	08-09-2009	33	2a03:77c0::/32	Saudi Post Organization	29-11-2012	-
8	2a02:df0::/32	AL Faisaliah Internet Services	05-05-2009	30-01-2013	34	2a02:edc0::/29	SAUDI CAPITAL MARKET CO.	03-12-2012	-
9	2a02:fc0::/32	SPSNET	08-06-2009	-	35	2a02:fa00::/29	Authority of Developing Al-madina Al-Munawara	02-01-2013	-
10	2a00:1560::/32	NourNet	28-10-2009	21-11-2009	36	2001:67c:1198::/47	YESSER E-GOVNMENT PROGRAM	07-01-2013	12-01-2013
11	2a00:15d8::/32	NESMA	04-11-2009	09-11-2009	37	2a03:e7c0::/32	King Saud University	28-01-2013	-
12	2a00:1698::/32	Shabakah Net	17-11-2009	23-11-2009	38	2a00:50a0::/32	Saudi International Telecom & Electronic Co	05-03-2013	-
13	2a00:18f8::/32	Applied Technologies Co.	29-12-2009	22-03-2010	39	2a00:6ca0::/32	Ma'aden Aluminium Company	08-04-2013	-
14	2a00:1918::/32	Middle East Internet Company	31-12-2009	-	40	2a00:8820::/32	Al Khaleej Training And Education	16-05-2013	-
15	2001:67c:130::/48	CITC	01-02-2010	27-02-2010	41	2001:67c:1b0c::/48	Arab National Bank Saudi Stock Co.	18-06-2013	-
16	2a00:1ef8::/32	Jeraisy for Internet Services	13-04-2010	29-05-2012	42	2a00:b2e0::/32	Aljomaih Automotive Company Limited	10-07-2013	-
17	2a00:1f20::/32	Sultan Bin Abdulaziz Foundation	15-04-2010	-	43	2a00:cf20::/32	Integrated Information for Telecommunication & IT	22-08-2013	-
18	2a02:1650::/32	Saudi Business Machines	01-06-2010	-	44	2a04:7bc0::/29	ALI MOHAMMED AHMED ALHAMED EST	28-10-2013	-
19	2a02:24c8::/32	Integrated Networks Co.	27-09-2010	-	45	2a01:46a0::/32	Saudi Arabian Mining Company	29-10-2013	-
20	2a00:5400::/32	Integrated Telecom Co ITC	21-12-2010	-	46	2001:67c:18c8::/47	CITC	14-11-2013	25-03-2014
21	2001:67c:2164::/48	King AbdulAziz University	22-03-2011	-	47	2a01:57e0::/32	SABAH	25-11-2013	-
22	2a00:7680::/32	Samba Financial Group	08-05-2011	-	48	2a04:9940::/29	SEVEN EYES FOR MARKETING LTD	30-12-2013	-
23	2a00:7780::/32	Dignet	09-05-2011	-	49	2a01:7a20::/32	SABAH	13-01-2014	-
24	2a00:f580::/32	GulfNet KSA	01-06-2011	-	50	2a04:aa80::/29	Al Ra'idah Investment Company	04-02-2014	-
25	2a03:c080::/32	Global Arabian for Modern Application	27-10-2011	12-02-2012	51	2a04:c180::/29	SABAH	20-03-2014	-
26	2001:67c:2624::/48	Saudi Hollandi Bank	28-12-2011	10-11-2012	52	2a04:c2c0::/29	SABAH	20-03-2014	-



IPV6 ALLOCATIONS IN SAUDI ARABIA



IPV6 STATUS IN KSA



Percentage of networks that have routed IPv6



CITC IPV6 PROJECT ACTIVITIES/EFFORTS AND PROGRESS

2008-2012

Focus on Service Providers

Establishment of Task Force

Identify countries IPv6 best practices

International & regional cooperation (ITU, GCC, RIPE, MENOG, etc.)

Establish CITC IPv6 Lab and tunnel broker

Trainings and conferences

National internet services (Saudi ccTLD and filtering services)

2013-2015

Focus on Enterprise

Conducting 4 Pilot Projects on Enterprise Scale

IPv6 deployment Guidelines and Procedures

Awareness and Capacity Building

International benchmark amongst 10 countries

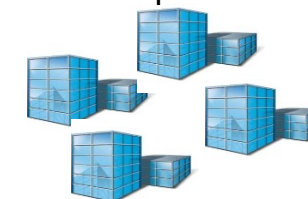
Improve IPv6 Task Force Governance

CITC IPv6 Lab Enhancement

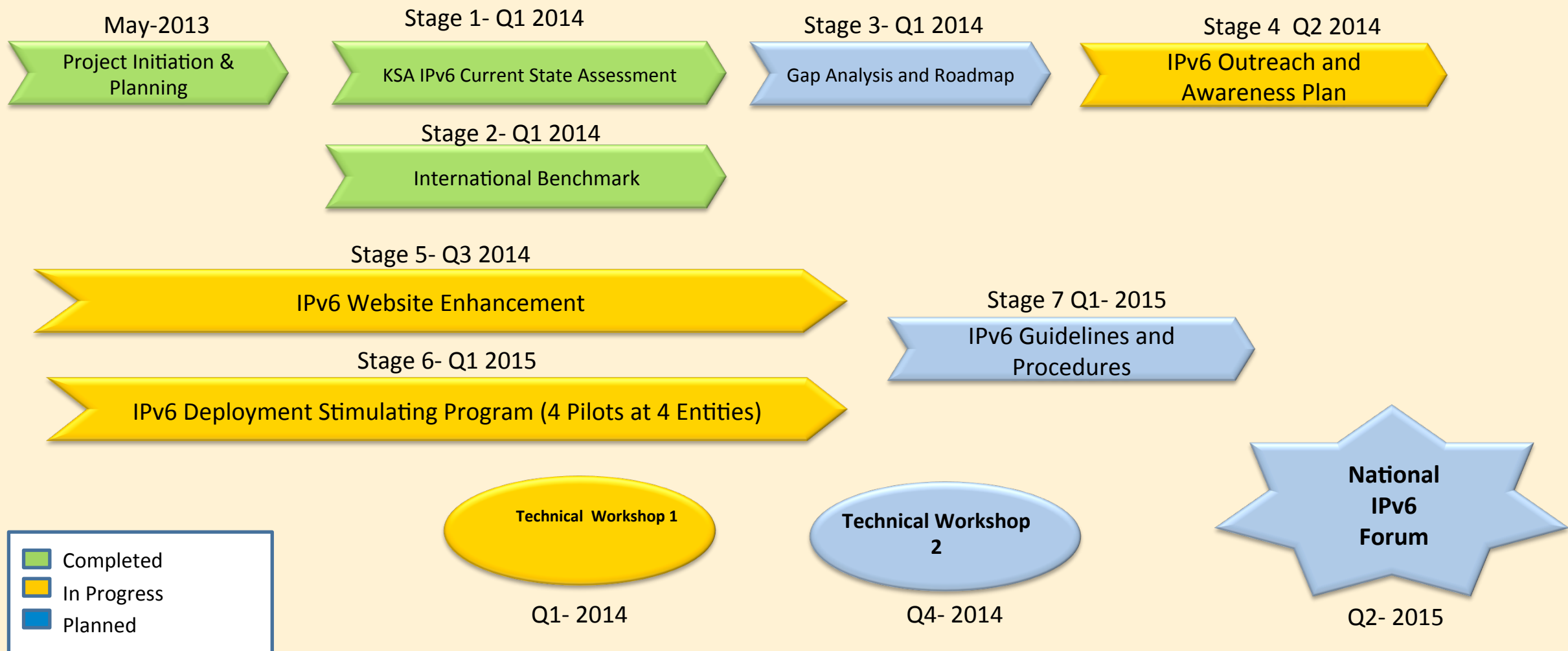


9 Countries

4 Enterprises



CITC'S CURRENT IPV6 PROJECT OVERVIEW



INTERNATIONAL COUNTRIES BENCHMARK



IPv6 strategies, Regulations and roadmaps



IPv6 stakeholders' efforts



Benchmark Review Domains



Levels of IPv6 usage and prefixes deployments



Promotion, Awareness, Education

Key Findings:

- Government played significant role in IPv6 deployment
- IPv6 taskforces important for stakeholder collaboration
- Development of national IPv6 strategy and roadmap
- Establishment of government IPv6 programs with clear milestones
- Continuous IPv6 awareness campaigns
- No IPv6 enforcement policies



IPV6 SURVEY

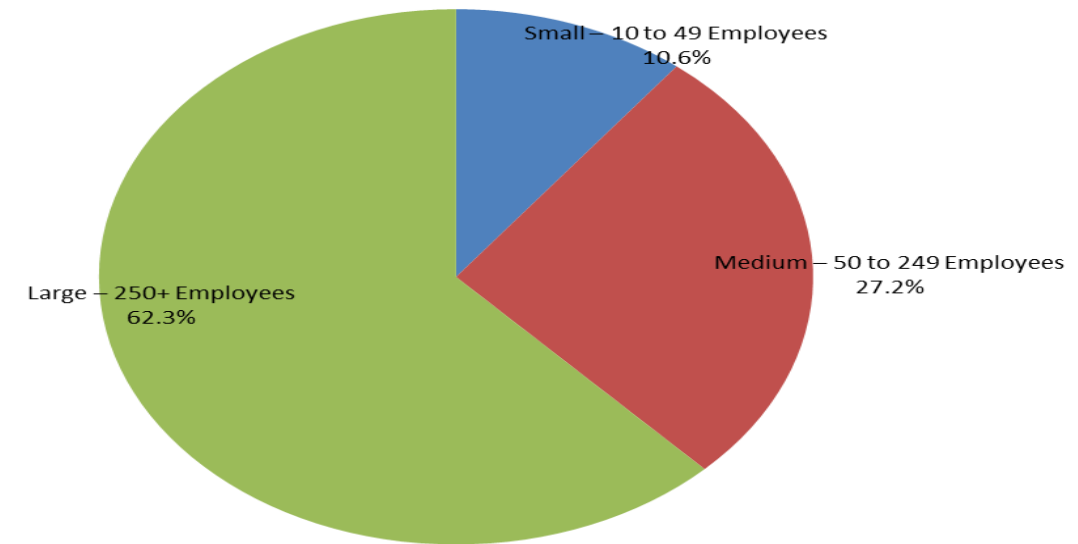
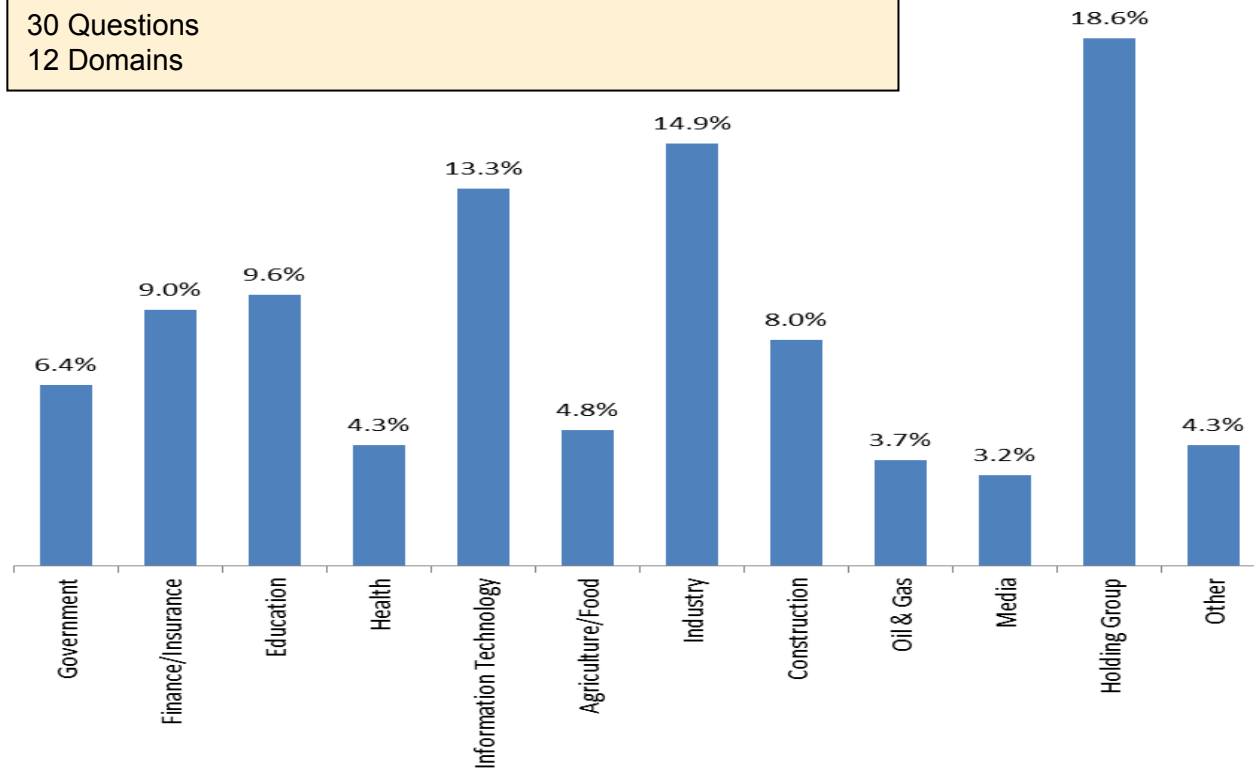


IPV6 READINESS SURVEY

- Survey Objective: Get a better understanding of IPv6 readiness of organizations and enterprises in KSA.

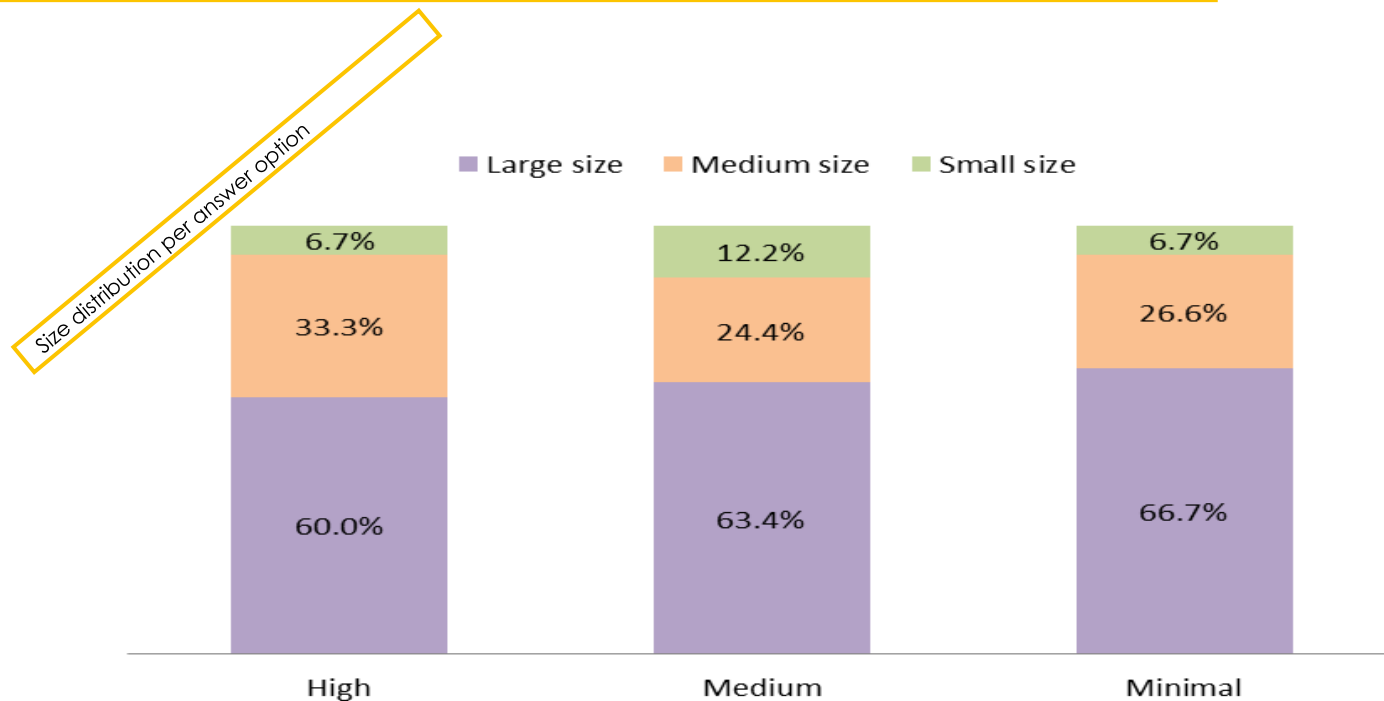
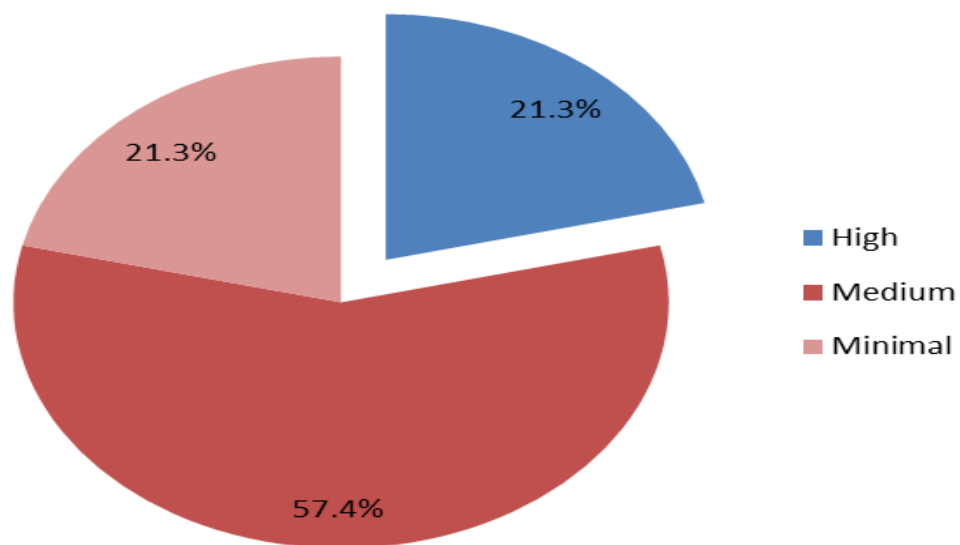
242 organizations and enterprises participated
121 fully submitted the survey
Q4 2013

30 Questions
12 Domains



AWARENESS AROUND IPV4 DEPLETION

Q: How would you describe the general level of awareness of your organization on the expected depletion of the Internet Protocol version 4 (IPv4) addresses?

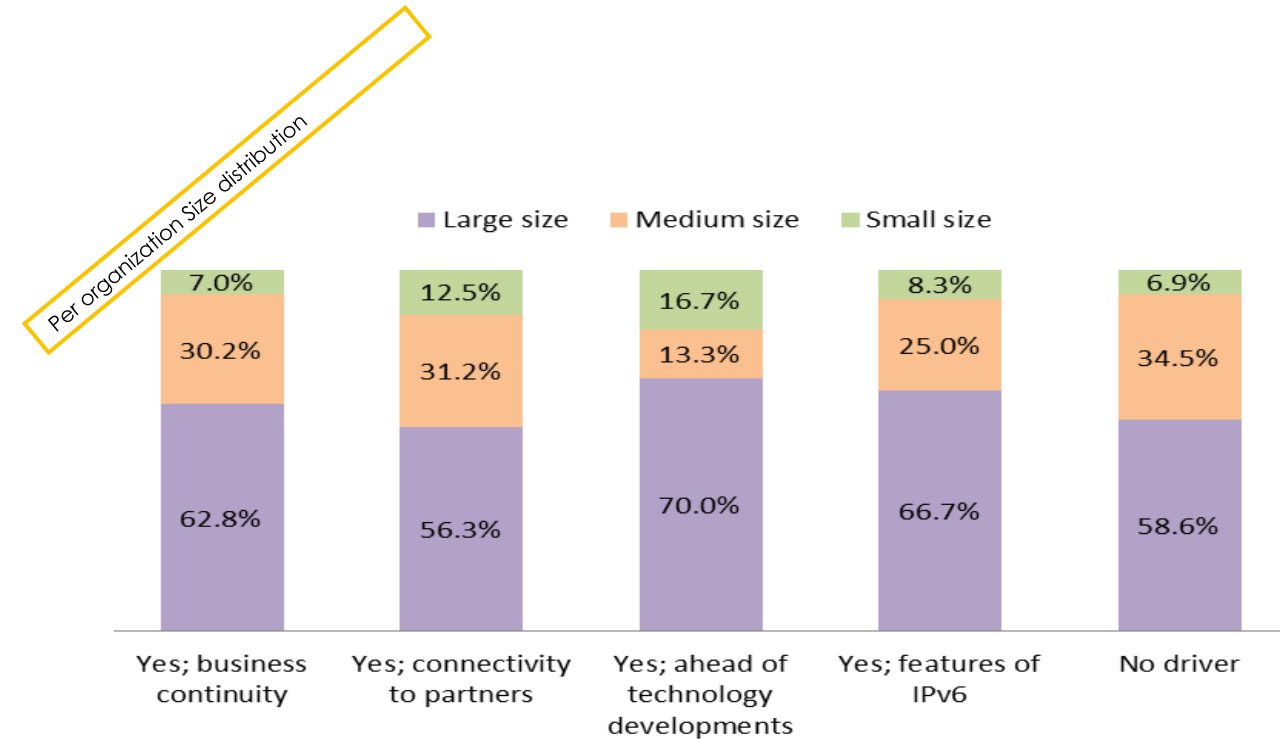
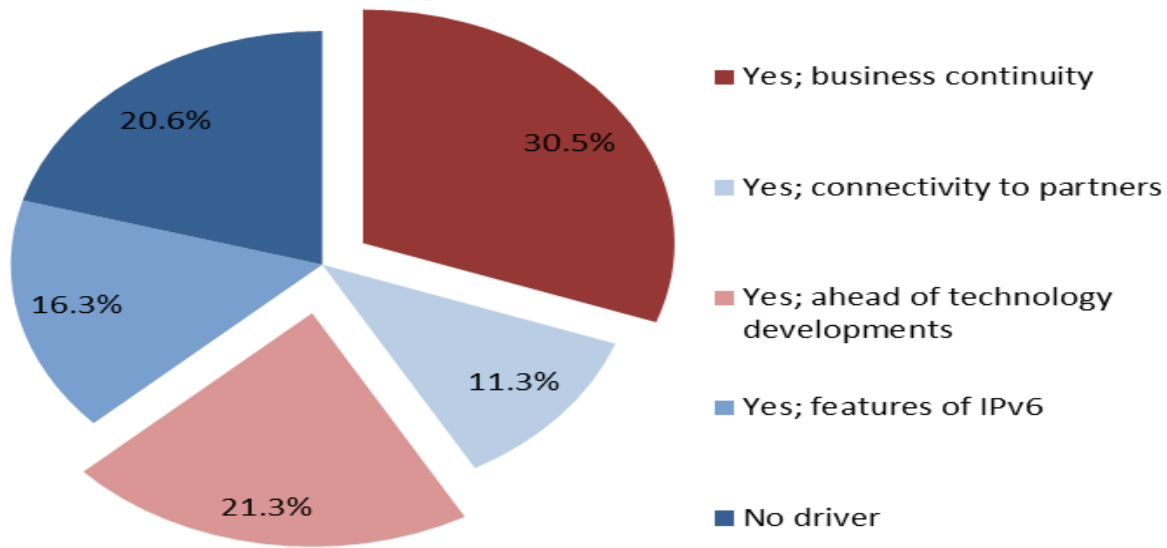


- IPv6 Awareness requires further outreach



IPV6 ADOPTION DRIVERS

Q: Do you foresee strong drivers to adopt IPv6 by your organization?

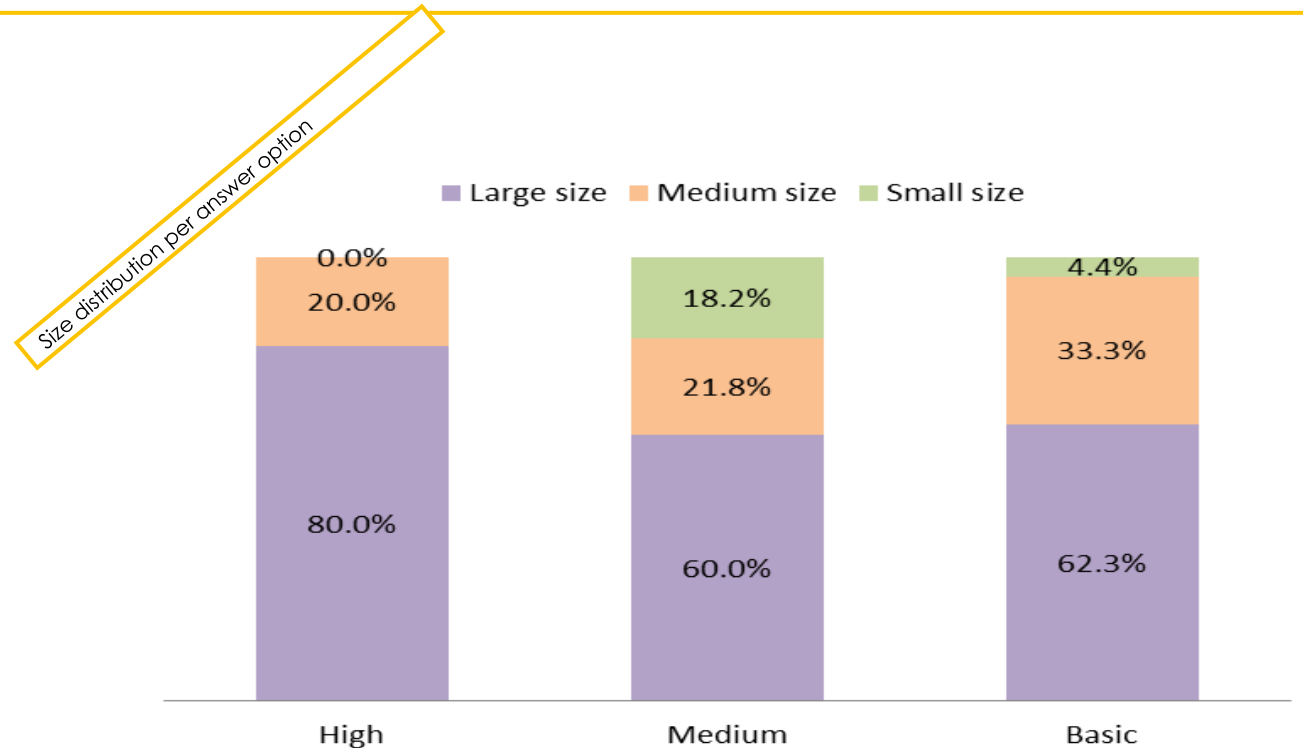
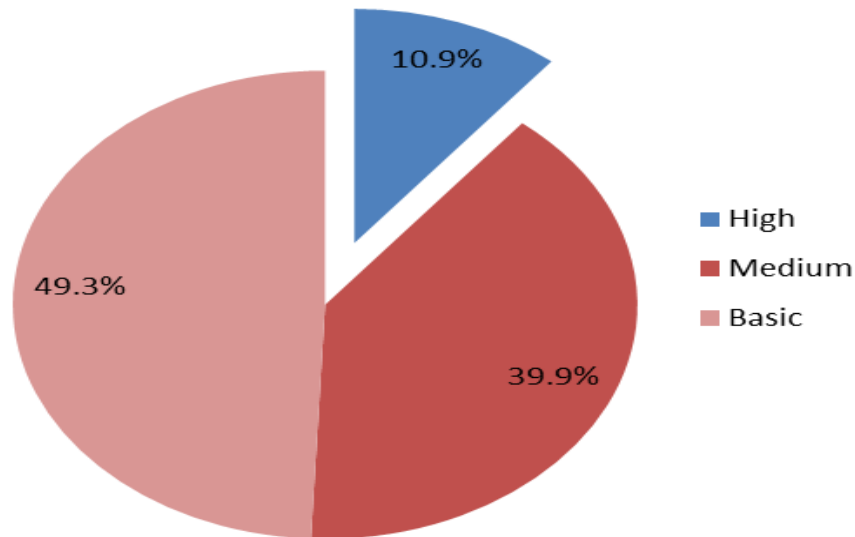


- Entities revealed strong drivers for adopting IPv6
- A healthy outcome hinting at future IPv6 demand



IPV6 SKILLS

Q: How would you describe the IPv6 related skills and expertise of ICT technical personnel at your organization?

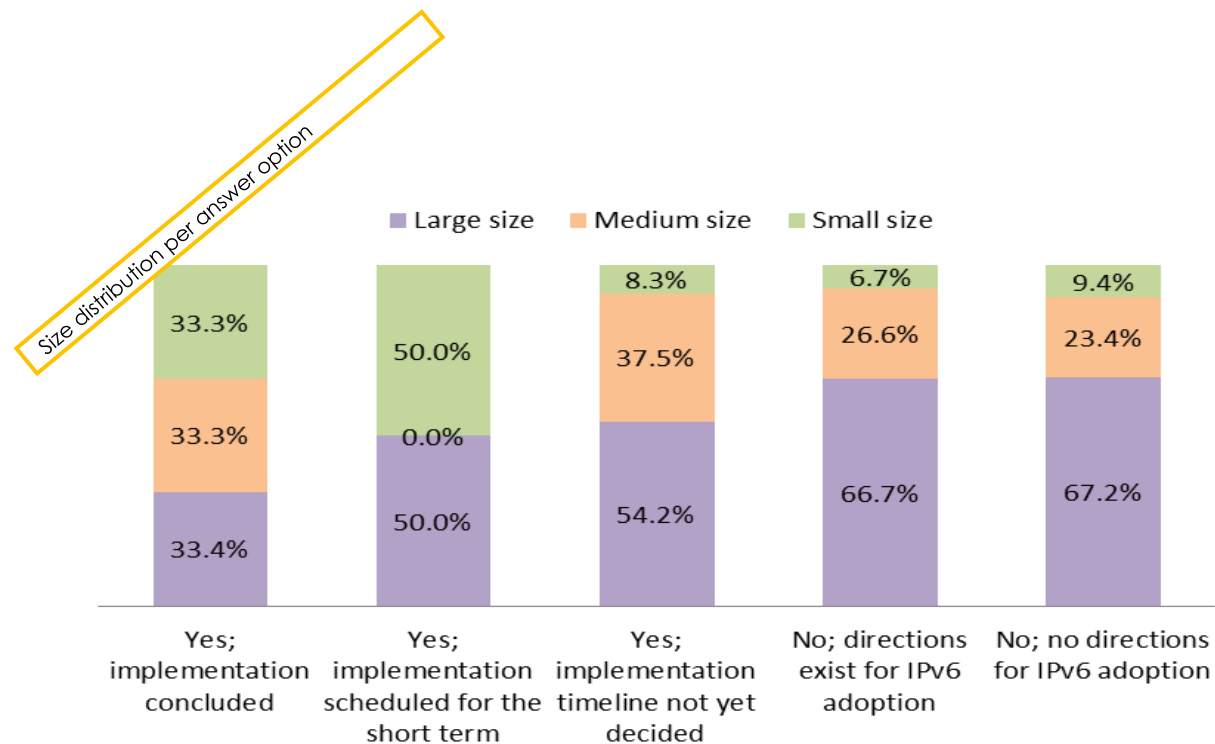
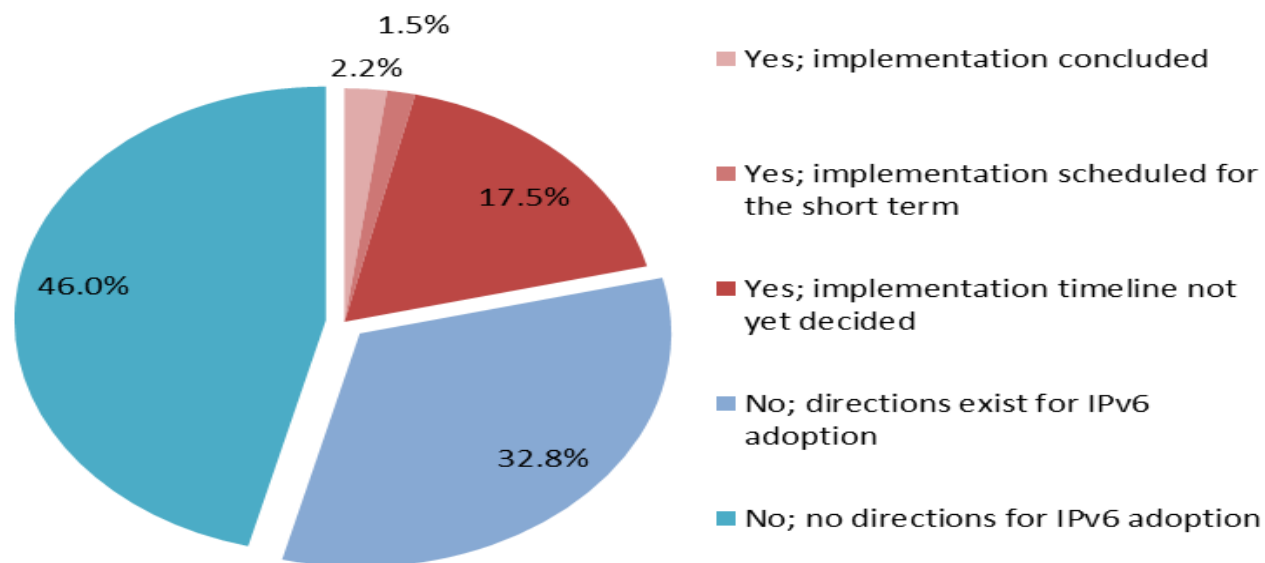


- Invest in IPv6 skills within organizations
- Outreach IPv6 training to facilities



IPV6 DEPLOYMENT/ADOPTION PLAN

Q: Has your organization defined a plan for IPv6 adoption?

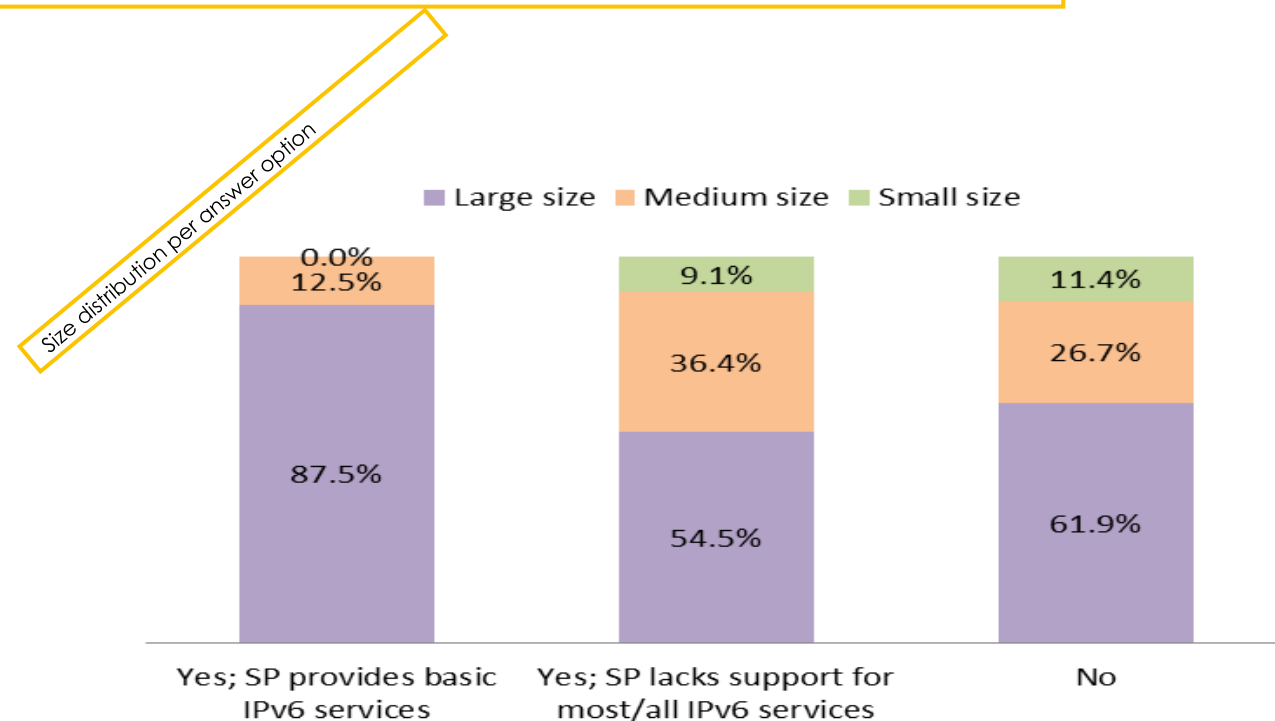
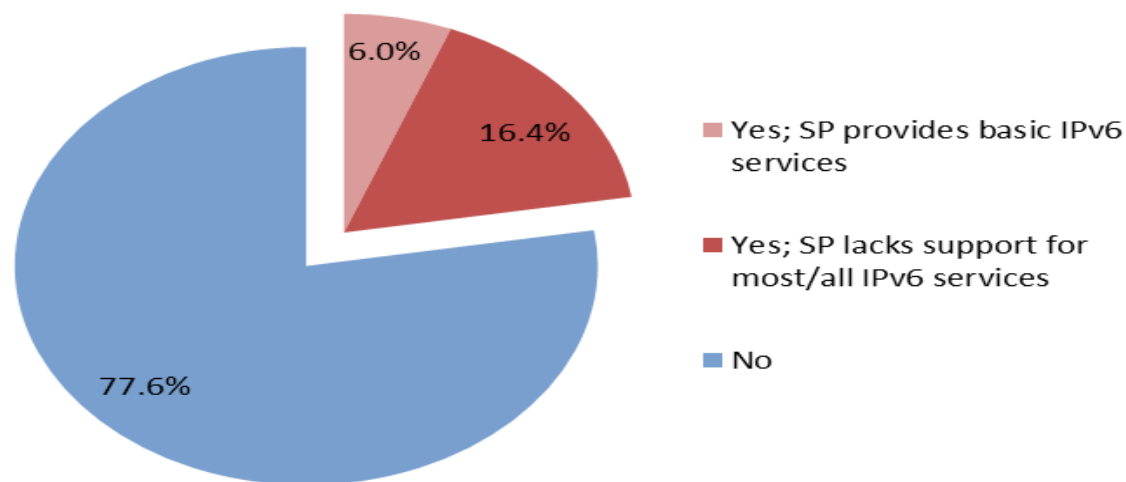


- Development of an IPv6 guidelines document is essential to help organization better plan for IPv6



IPV6 SUPPORT BY SERVICE PROVIDERS

Q: Have you approached and discussed with your internet service provider their readiness / plans to offer their services over IPv6?

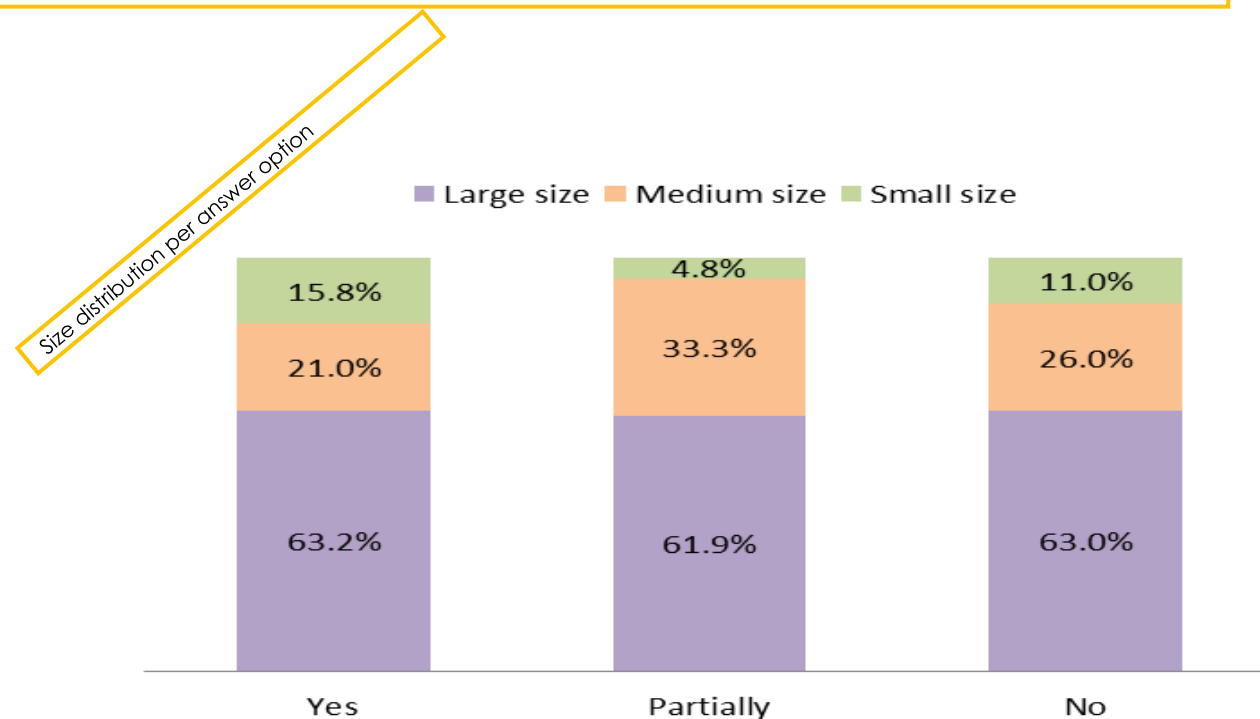
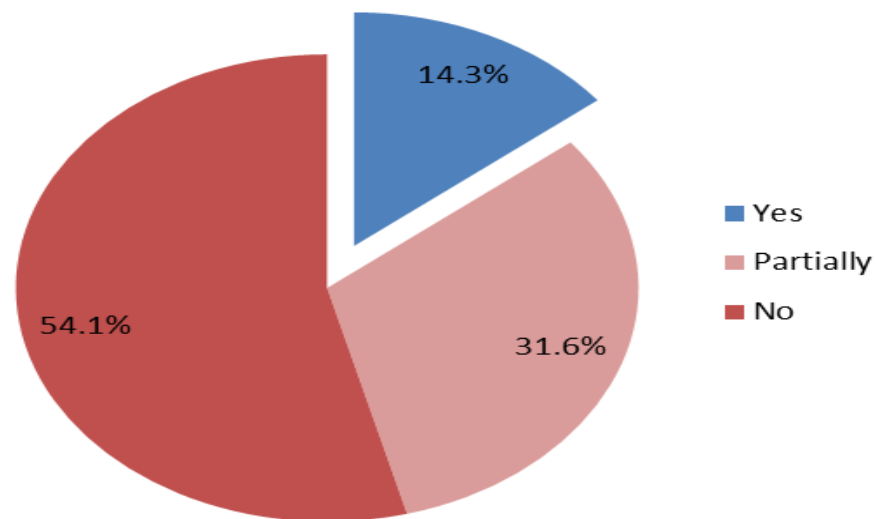


- Encourage approaching service providers to obtain IPv6
- Main FBPs do not support IPv6 yet



IPV6 COMPLIANT PROCUREMENT POLICIES

Q: Do your procurement policies (RFIs, RFPs, Specifications) consider IPv6 compliance of new hardware and software as a requirement?



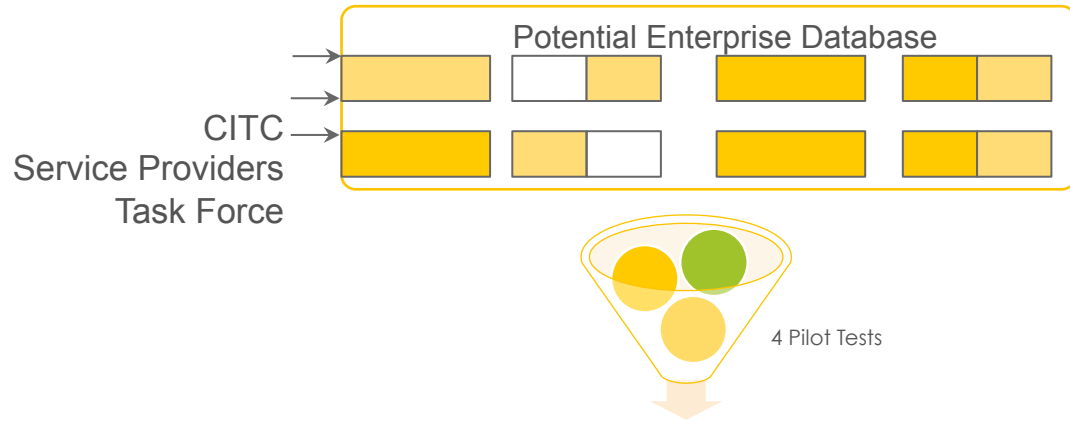
- ICT investment protection



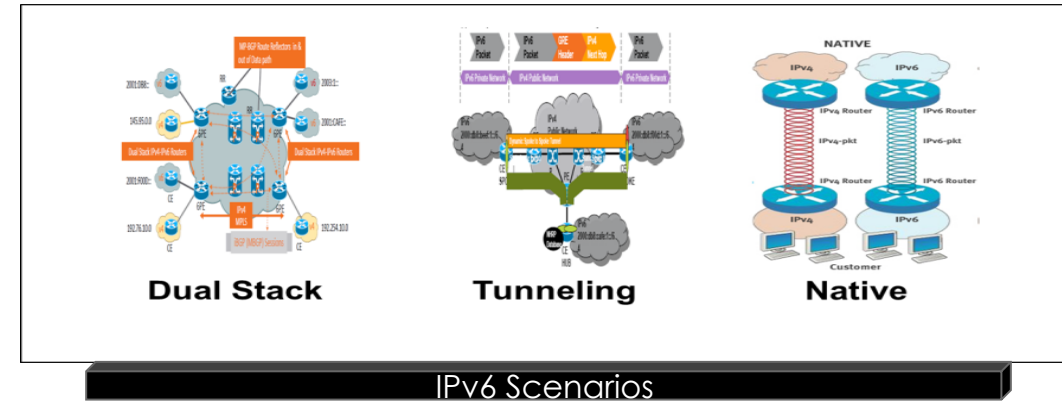
NEXT STEPS



CITC IPV6 DEPLOYMENT PILOTS

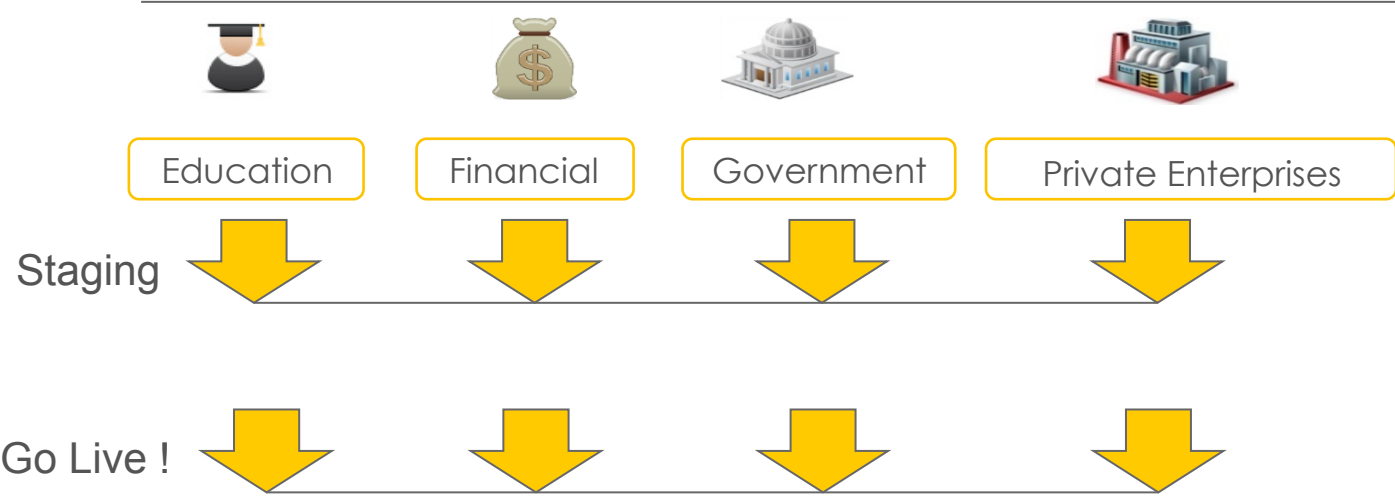


IPv6 enablement for internet facing services: DNS Website, Mail, etc.



CITC Lab equipped to:

- Simulate all IPv6 Scenarios for pilot and public demonstrations
- Provide practical implementation of guidelines and procedures



GUIDELINES & PROCEDURES

IPv6 & IPv4 Threat Review with Dual-Stack Considerations
Troy Latawiec
University of Southampton, Department of Electronics and Computer Science

Abstract—The gradual transition from IPv4 to IPv6 requires network administrators to broaden areas of the risk posture beyond IPv4 and the associated security risks. IPv6 provides some advantages for domains associated with high growth and global connectivity. However, the low presence of IPv6 makes network administrators wary of security risks. This paper provides a combined review of the IPv6 security risks and the associated IPv4 and IPv6 security risks. It also provides a combined review of the IPv6 and IPv4 security risks and the associated IPv4 and IPv6 security risks. The paper provides a combined review of the IPv6 and IPv4 security risks and the associated IPv4 and IPv6 security risks. The paper provides a combined review of the IPv6 and IPv4 security risks and the associated IPv4 and IPv6 security risks.

Best practices

Guidelines

Procedures

Guidelines of Value !

- Practical & implemented on Pilots
- Customized for KSA
- Simplified and Clear
- Available for Public
- Published in Arabic & English

IPv6 router: yes no
DNS/BIND automatic updates (hosts only): yes no
IPv6 interfaces: yes no
IPv4 tunnel: yes no
Configured tunnel: yes no
Automatic tunnel: yes no
Manual routes: yes no
Start IPv6: yes no

2 DNS/BIND
Domain name: _____
Host Address: _____
File Path: _____
Address prefix (hosts only): _____
Router address: _____

3 Configured Tunnel
Type: IPv4 IPv6
Interface: _____
Destination IPv4 address: _____
Source IPv4 address: _____
RIPing: yes no
Address prefix: _____

4 Router
Interface: _____
RIPing: yes no
Address prefix: _____
Interface: _____
RIPing: yes no
Address prefix: _____

5 Manual Routes
Destination prefix: _____
Interface: _____
Next hop address: _____
Destination prefix: _____
Interface: _____
Next hop address: _____

Test your IPv6 connectivity.

Summary: IPv6 ready IPv6 not ready

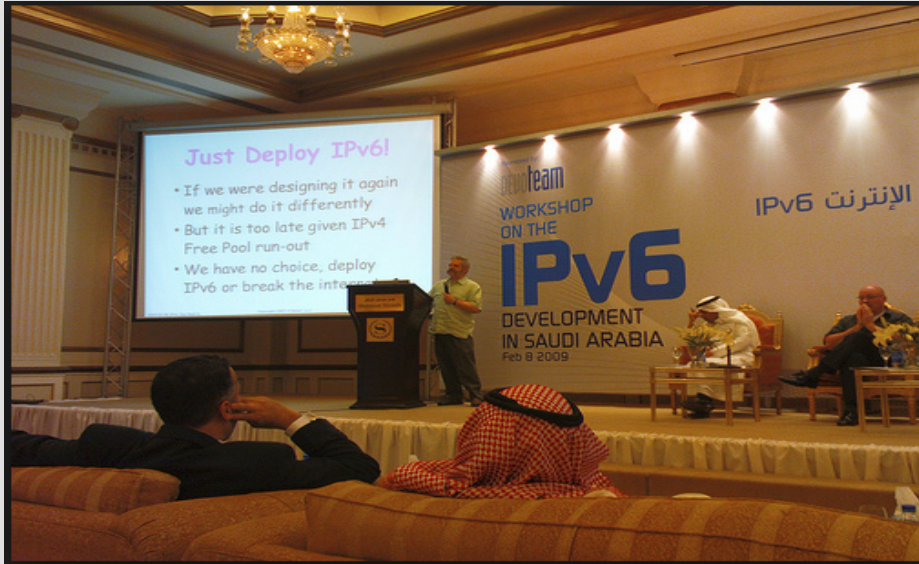
- 1 Your IPv4 address on the public internet appears to be 192.168.1.1
- 2 No IPv6 address detected (IPv6 disabled)
- 3 Your DNS server (possibly run by your ISP) appears to have restricted your ability to reach IPv6-only sites.
- 4 You appear to be able to browse the IPv6 Internet only. You are not able to reach IPv6-only sites.
- 5 Your DNS server (possibly run by your ISP) appears to have restricted your ability to reach IPv6-only sites.

10/10 for your IPv4 stability and readiness, when publishers offer both IPv4 and IPv6
0/10 for your IPv6 stability and readiness, when publishers are forced to go IPv6 only

Click to see [testlog](#)

TECHNICAL WORKSHOPS

Project Planned IPv6 Workshops



First Technical
Workshop

Q1 (2014)

Second Technical
Workshop

Q4 (2014)

IPv6 National
Forum

Q2 (2015)

The first technical IPv6 Workshop held on Thursday, 6th of March 2014



QUESTIONS?

