

# *Status of IPv6 Readiness Measurement in Taiwan*

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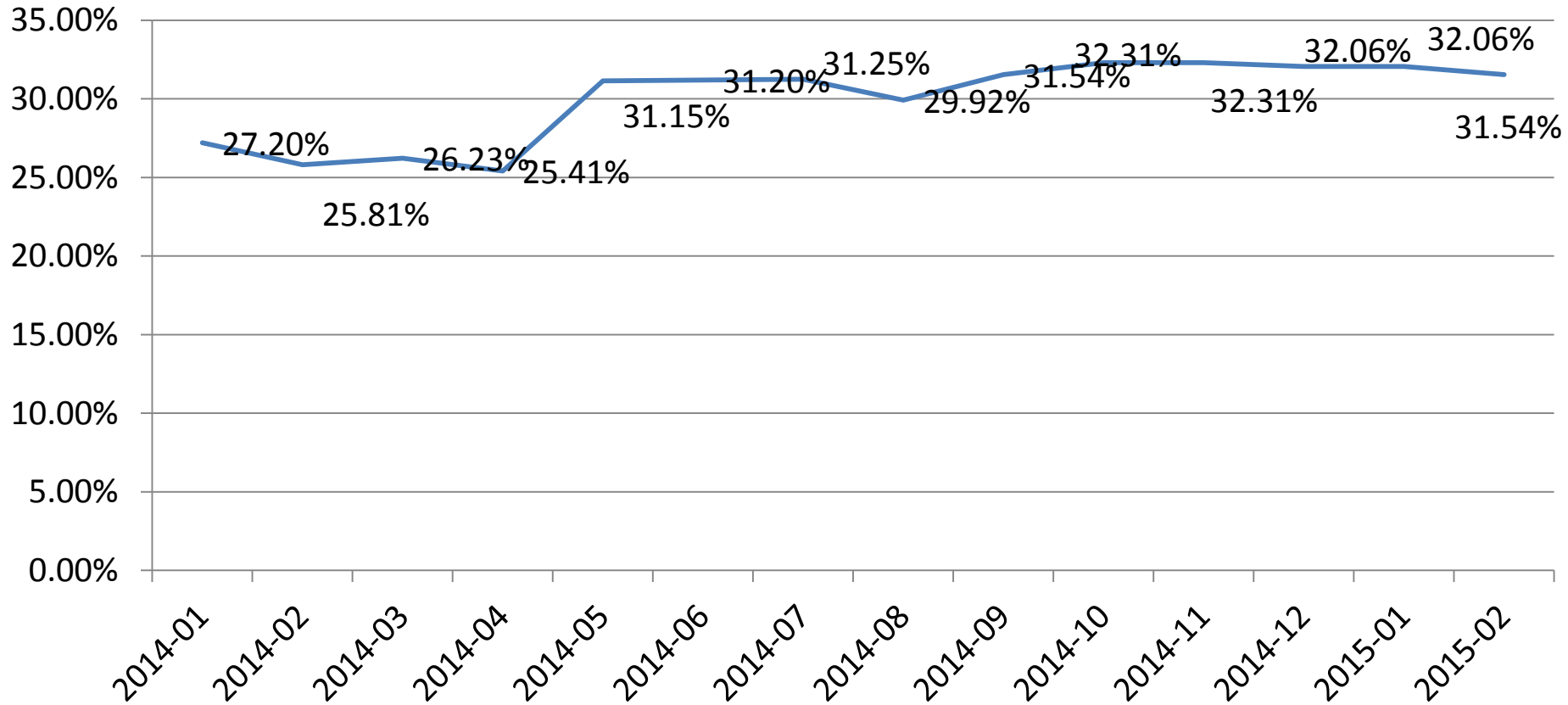


**IPv6 Readiness Measurement BoF**

# Classification of different Measurement Criteria

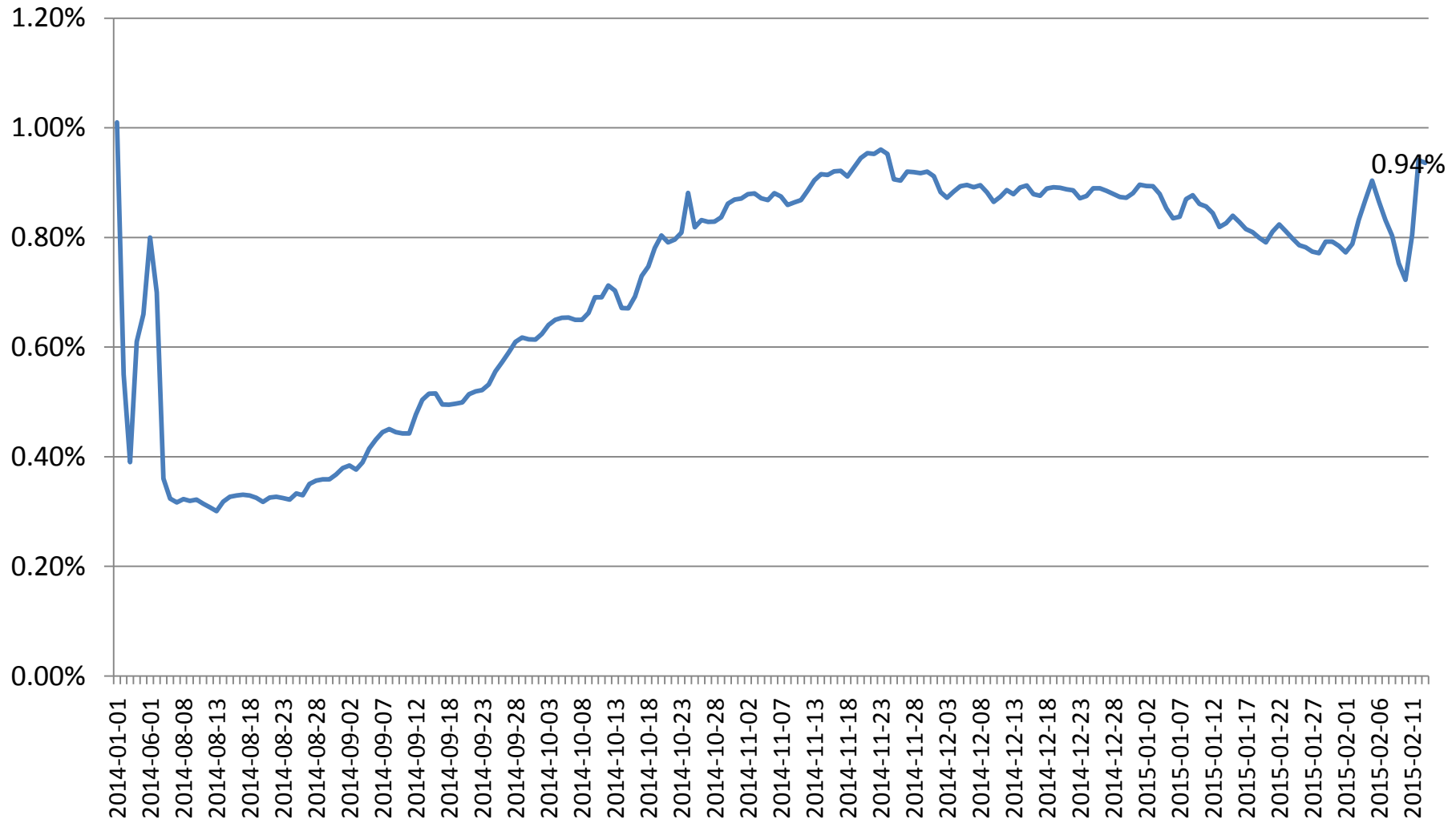
|         | Measurement Criteria                             | ccTLDs/Organizations                                              |
|---------|--------------------------------------------------|-------------------------------------------------------------------|
| Network | Network Latency                                  | RIPE NCC, Akami                                                   |
|         | Network Traffic                                  | IRINN, TWNIC                                                      |
|         | IPv6 allocation and BGP advertisement            | JP IPv6 PC, IRINN, NZ IPv6 TF, TWNIC, RIPENCC, Cisco              |
| Service | Service (Web, DNS, E-mail) availability of ccTLD | CNNIC, JP IPv6 PC, IRINN, NZ IPv6 TF, TWNIC, TH IPv6 Fourm, Cisco |
|         | DNS query to ccTLD                               | CNNIC, NZ IPv6 TF, TWNIC                                          |
| User    | User availability                                | APNIC, Google, TWNIC, Cisco                                       |
| Product | Number of IPv6-enabled products                  | JP IPv6 PC, TWNIC                                                 |

# IPv6 allocation and BGP advertisement



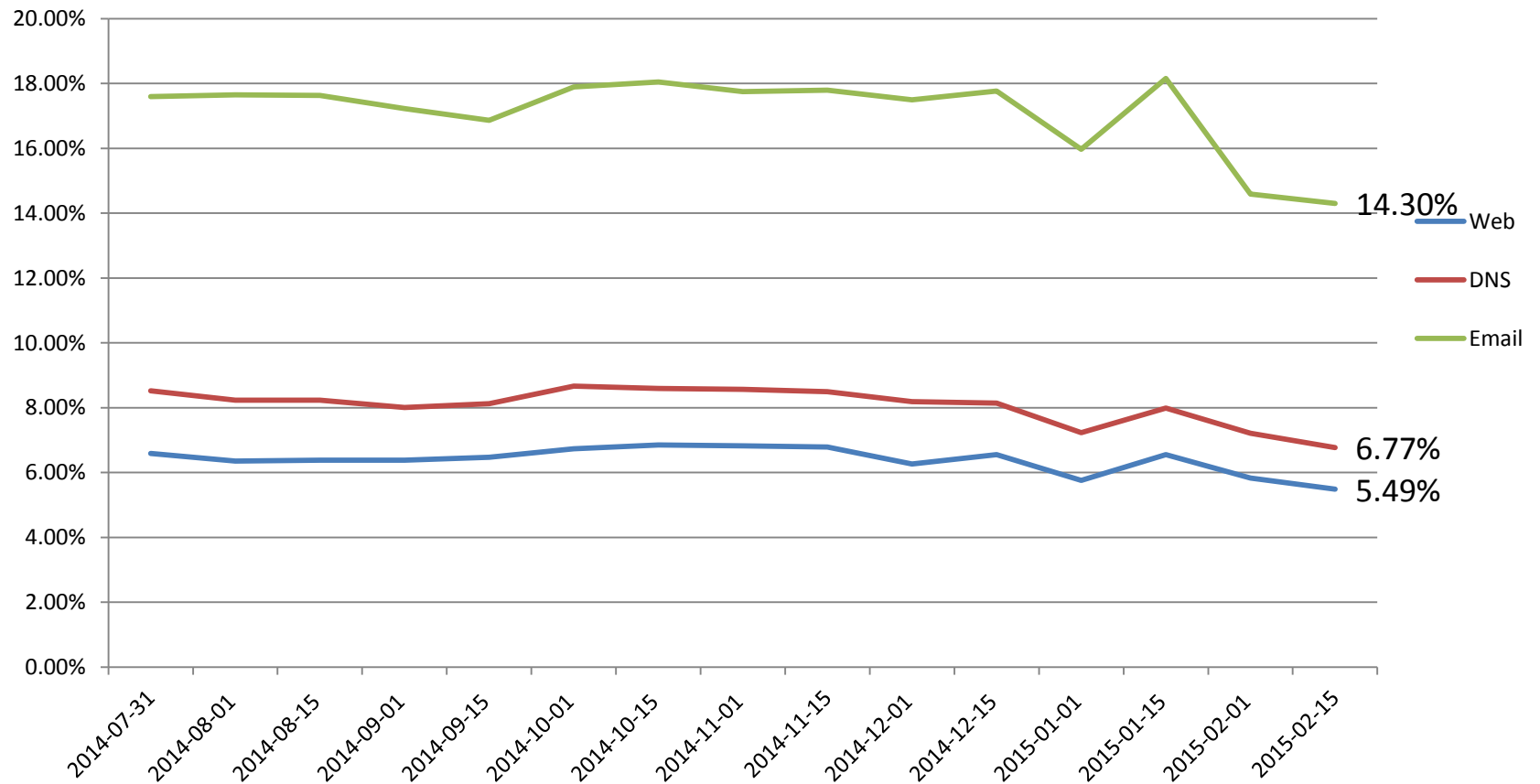


# User Availability





# Service Availability



# Classification of different Measurement Criteria

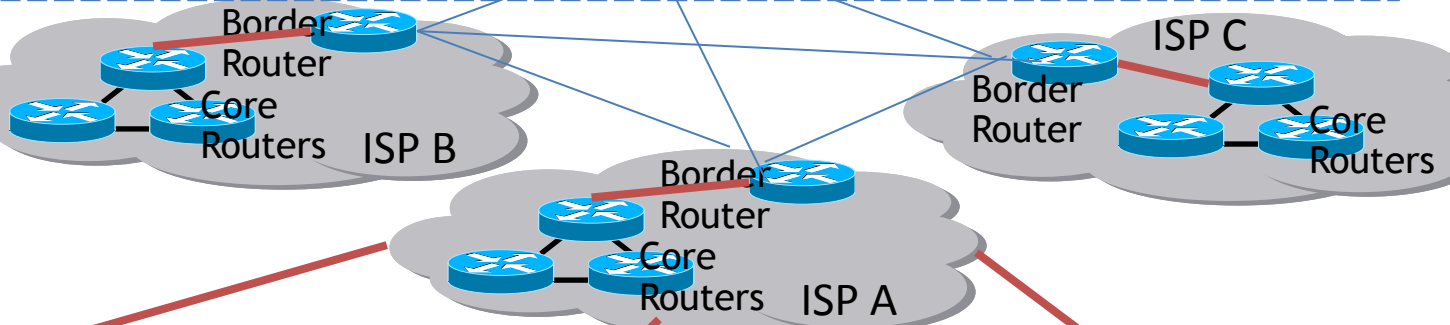
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|         | Access router/gateway availability               | TWNIC                                                             |
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|         | DNS query to ccTLD                               | CNNIC, NZ IPv6 TF, TWNIC                                          |
| User    | User availability                                | APNIC, Google, TWNIC, Cisco                                       |
|         | Home Gateway availability                        | TWNIC                                                             |
| Product | Number of IPv6-enabled products                  | JP IPv6 PC, TWNIC                                                 |

# Internet Operation Diagram

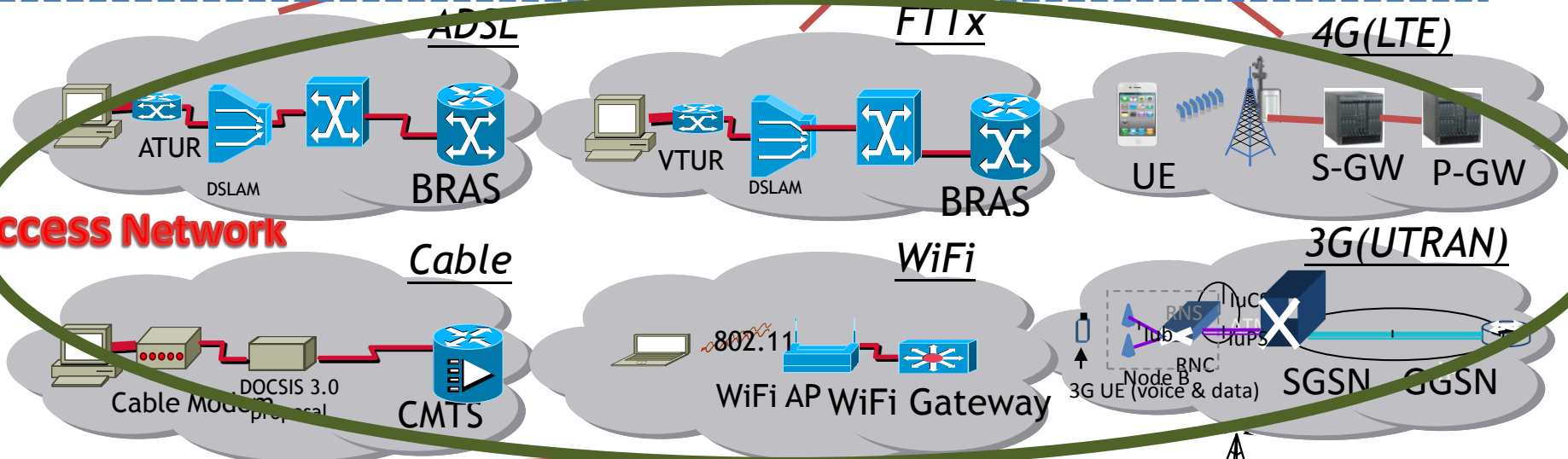
## Services



## Core Network



## Access Network

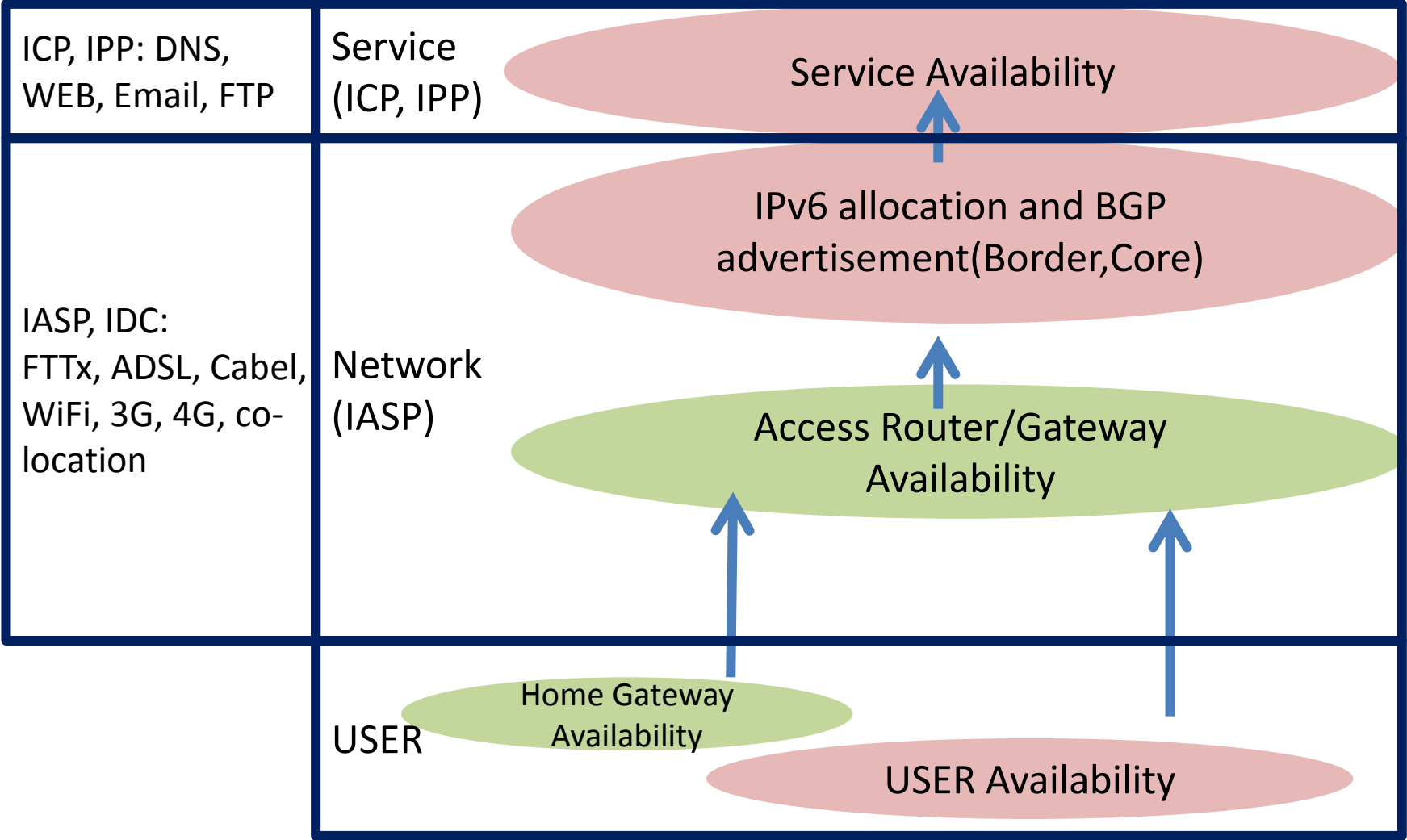


## Users





# Structure of IPv6 Readiness





# IPv6 Access router/gateway availability

- **Motivation**

-we suppose the ISP access service devices are ready for the IPv6 , then the utilization of IPv6 will be happen at any moment.

- Conduct a survey by questionnaire
- Check whether ISP internet access service device is ipv6 capable.
- Survey date: Jan 2015;
- Sample: TWNIC 61 IP registrars;
- Response rates: 98%





# Survey results

| Internet Access Service | # of ISPs |
|-------------------------|-----------|
| FTTx                    | 21        |
| ADSL                    | 7         |
| Cable Modem             | 14        |
| WiFi                    | 4         |
| 3G/3.5G                 | 5         |
| 4G                      | 5         |

- Among 60 ISPs , 48 ISPs provide wired/wireless internet access services .
- Within 48 ISPs, 44% and 29% ISPs provide FTTx and Cable access service respectively , which are the top 2.

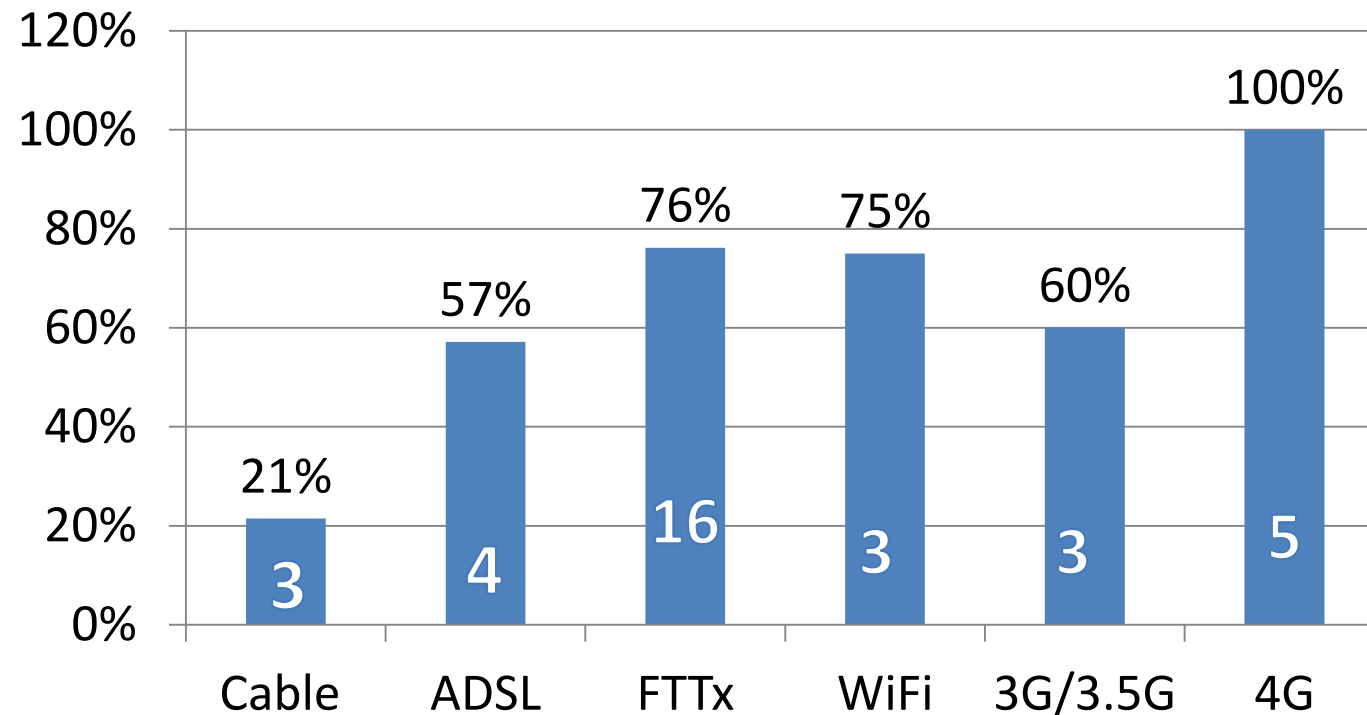


# Survey results

- Cable , FTTx, ADSL, WiFi, 3G/3.5G, 4G are the 6 major access services
- Each access service is correspond to different access devices .

| Internet Access Service | Cable | ADSL | FTTx               | WiFi            | 3G/3.5G       | 4G                    |
|-------------------------|-------|------|--------------------|-----------------|---------------|-----------------------|
| Access Device           | CMTS  | BRAS | BRAS,<br>L3 Switch | WiFi<br>Gateway | GGSN,<br>SGSN | MME,<br>S-GW,<br>P-GW |

# IPv6 Access Router/Gateway Availability



| Internet Access Service | # of ISPs |
|-------------------------|-----------|
| FTTx                    | 21        |
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| 4G                      | 5         |

| Internet access Service | Cable | ADSL | FTTx            | WiFi         | 3G/3.5G    | 4G              |
|-------------------------|-------|------|-----------------|--------------|------------|-----------------|
| Access Device           | CMTS  | BRAS | BRAS, L3 Switch | WiFi Gateway | GGSN, SGSN | MME, S-GW, P-GW |

# IPv6 Home Gateway availability

## Motivation

- Hinet is the largest ISP in Taiwan, and already provides FTTx access service with IPv6.
  - we suppose if 3.2 million Hinet's FTTx users' home gateways are all IPv6 capable, then the user availability will largely increase.
- 
- conduct survey by reviewing home gateway spec. from 15 major vendors/manufacturers , which are over 50% market share.



# IPv6 Home gateway availability

| 8 vendors (53.3%) Home gateway support IPv6                                    |                                                                                                                              | 7 vendors(46.7%) Home gateway not support IPv6                                                                                                                  |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5 vendors(33.3%) have IPv6-capable home gateways with the IPv6 PPPoE function  | <ul style="list-style-type: none"><li>1.ASUS</li><li>2.D-Link</li><li>3.DrayTek</li><li>4.SAPIDO</li><li>5.TP-LINK</li></ul> | <ul style="list-style-type: none"><li>1.Buffalo</li><li>2.Cerio</li><li>3.EDIMAX</li><li>4.HUAWEI</li><li>5.Netis</li><li>6.Tenda</li><li>7.TOTO LINK</li></ul> |
| 3 vendors(20%) have IPv6-capable home gateways without the IPv6 PPPoE function | <ul style="list-style-type: none"><li>1.LevelOne</li><li>2.NETGEAR</li><li>3.ZyXEL</li></ul>                                 |                                                                                                                                                                 |



# Conclusion

- Regarding ipv6 promotion ,nowadays, to provide ipv6 internet access service is the most concern .
- For providing internet access service ,ipv6 capable access router/gateway is a must .
- Home gateway is one of the critical devices for home users to access ipv6 network.
- How to get more accurate ipv6 capable access device data? We consider to cooperate with isp/vendor/manufacture to build a mechanism of data collection.



Thank you  
Please join us:

Mailing list: [ap-v6readiness@ap-v6readiness.org](mailto:ap-v6readiness@ap-v6readiness.org)

Website: <http://www.ap-v6readiness.org>