

Use Case of Measurement Provider

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- Users **know the maximum bandwidth** of access line for fixed network (100Mbps to 2Gbps in FTTH) and mobile network (37.5Mbps to 112.5Mbps in LTE).
- But, users **do not know the performance** of the actual network.
- Users want to **know the performance** from users to multiple **content providers** using their access ISP.
 - They also want to know it of other ISPs to compare.
- This is a motivation that measurement providers need to measure the performance.

Purpose of the measurement

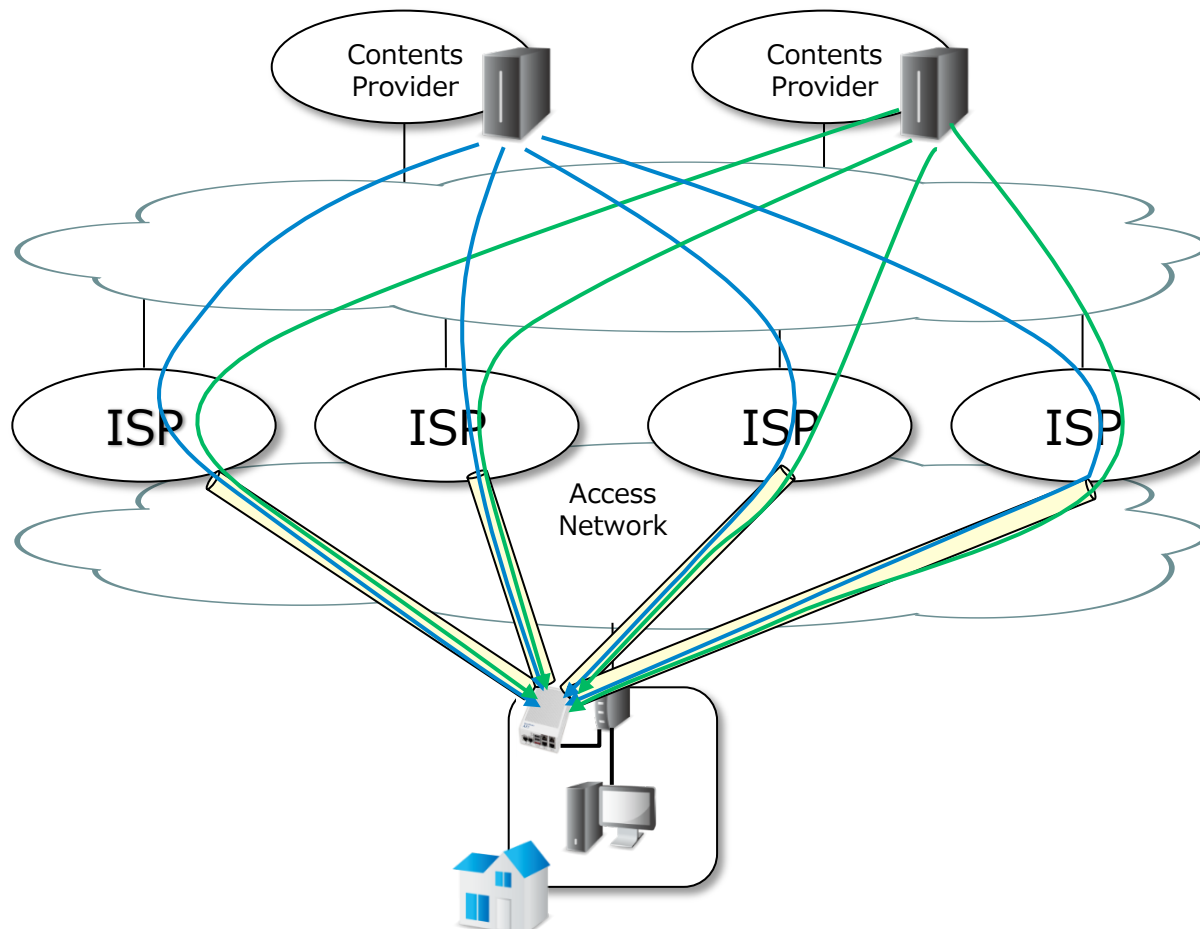


- The actual performance is important as an index when the user selects an ISP.
- By publishing QoS/QoE index, we can expect that the whole broadband ecosystem can attain much better performance.
- End users can overcome the information asymmetry and rationalize their buying behavior in the retail broadband market.
- Increased competitive pressures in the retail market will be the incentive for the ISPs to increase their investment for capacity development.
- ISP can recognize the status of the market better and compete more effectively with other players.

1. Measure fixed networks with dedicated hardware
 - 117 ISP-location sets by 9 MAs and 13 ISPs
2. Measure fixed networks with software
3. Measure mobile networks with smartphone
 - Run a measurement when users push a measurement button. We have been measured to the servers from 500,000 MAs.
 - Run a measurement periodically. Measurement application is executed periodically in the background. We have been measured to the servers from 2,000 MAs.
 - Because many people use a smartphone at a flat rate in Japan, they don't care traffic volume.

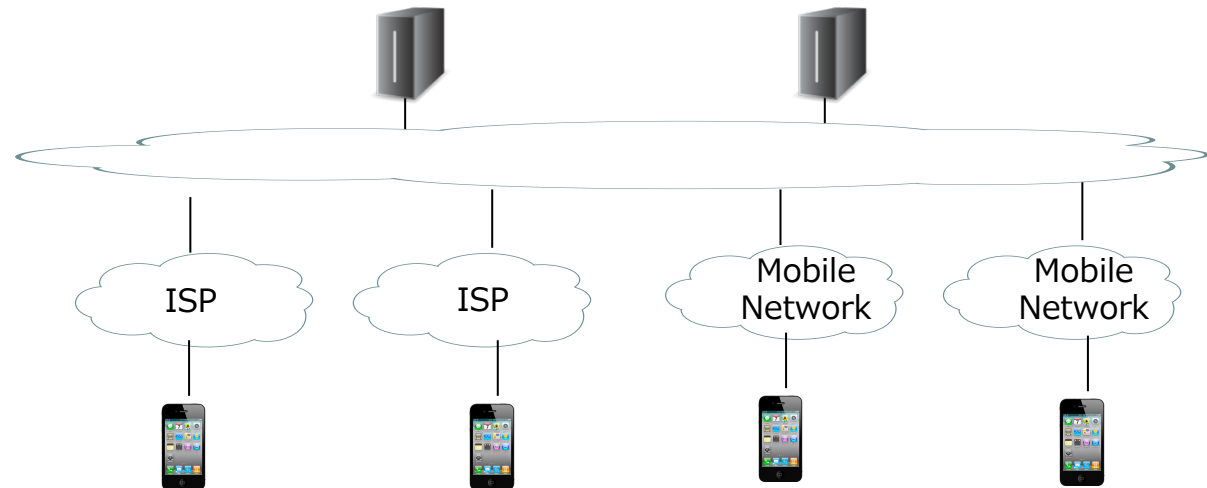
Measure fixed networks

- Measure a performance from home to contents provider
- Measure a multiple access ISPs from one location



Measure mobile networks with smartphone

- Measure a performance to the servers from 500,000 MAs.
- The servers are put on nearly IXs.

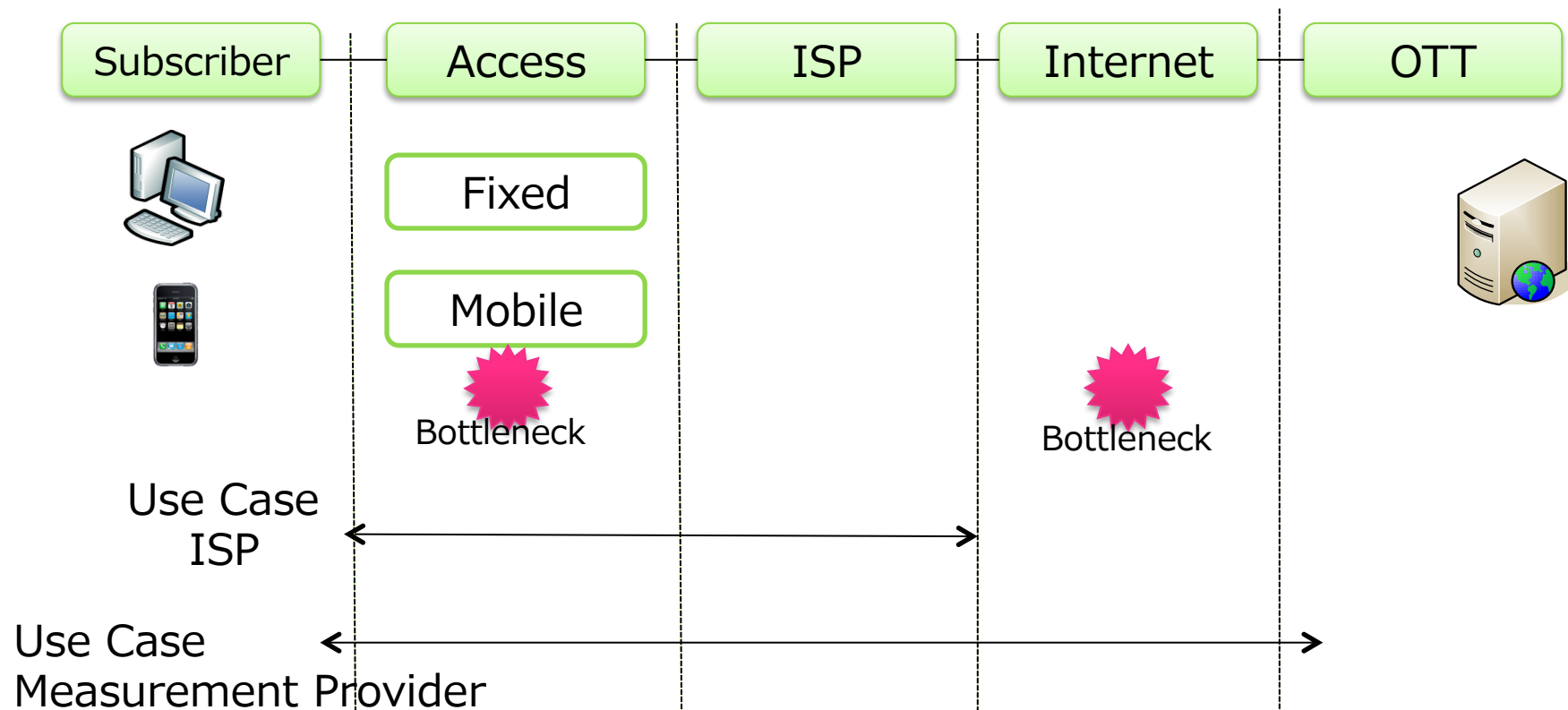


Type of Access	Speed (Mbps)	# of sample
3G	3.40	300,268
LTE	12.16	829,410
Wi-Fi (public)	9.22	225,083
Wi-Fi (home)	18.59	907,833
WiMAX	8.91	31,761

May 1 - July 26, 2013

Use Case of Measurement Provider

- Measurement provider measures a performance from MAs in the **users** (PC, dedicated hardware, smartphone) to MAs in the multiple **content providers**



- One MA performs the measurement a plurality of times. Therefore, many samples of various environments can be collected.
- In order to see the change in the long term, it is necessary to obtain the performance for a long time.
- Publish the results
 - Publish the results that are easy to understand for users
 - Show the detailed results to ISPs.
 - Need to **show the measurement parameters** in order to allow comparison with the result of the other