How We Use Identifiers and What We Expect Them to be

Workshop on Identifier in Future Internet
2010-2-24
Seoul National University, Korea

Keiichi Shima[*1], Futoshi Sasaki[*2], and Koji Ando[*2]
[*1]IIJ Innovation Institute Inc. [*2]Internet Initiative Japan Inc.

Notes

- This is a talk from the network service provider's point of view
- It will not be a technical discussion of how we design Internet identifiers, but it will provide how we design the Internet service

What kinds of IDs?

- MAC address
- EUI
- UUID
- Phone number
- IP address
- Port number
- Protocol number
- Protocol name
- Domain name
- Hostname
- Service name
- User ID
- Email address
- Google account
- Many many others...

But, frankly speaking,

- Most of such IDs are out of the network service providers' interest

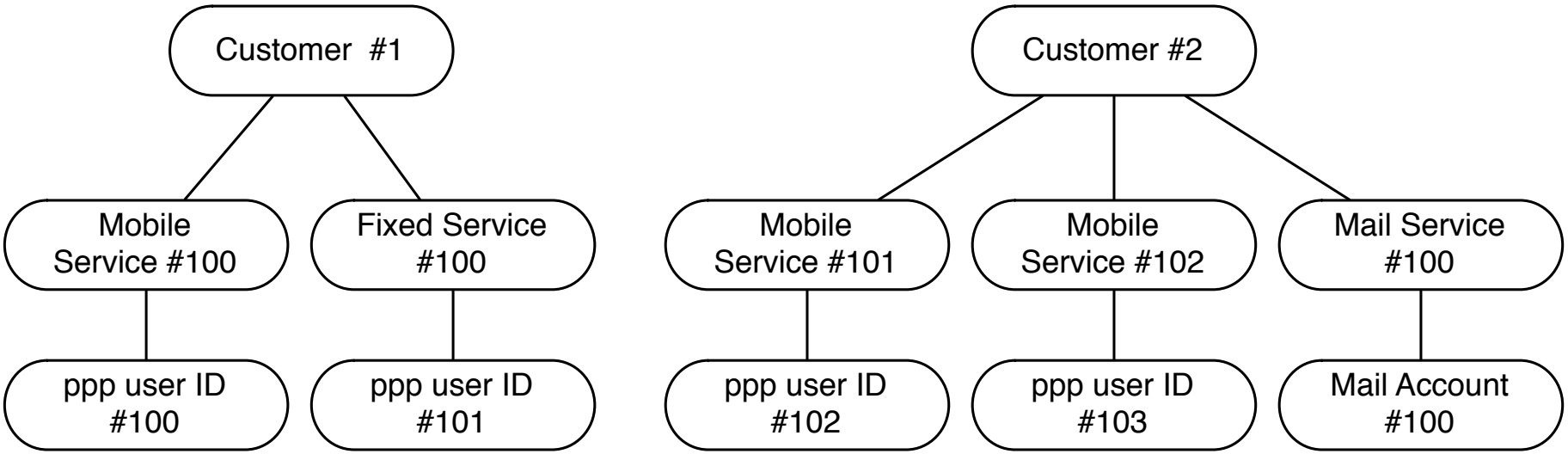
What is ID for?

- ID is a thing to bind a service component to a unique notation
- We are not working on managing IDs
  - Network service provider's main (and final) purpose is to provide reachability to the Internet to customers

Example of service identifiers

- Customer ID (which usually binds to an accounting entry)
  - A person / company may have multiple customer IDs
- Each service (Mail, Mobile, Fixed, etc) has its own service ID, which is bound to the customer ID
- Each service has its original ID space (ppp account, mail account, etc)

Example of service identifiers



So, where are network layer IDs?

Network layer IDs are

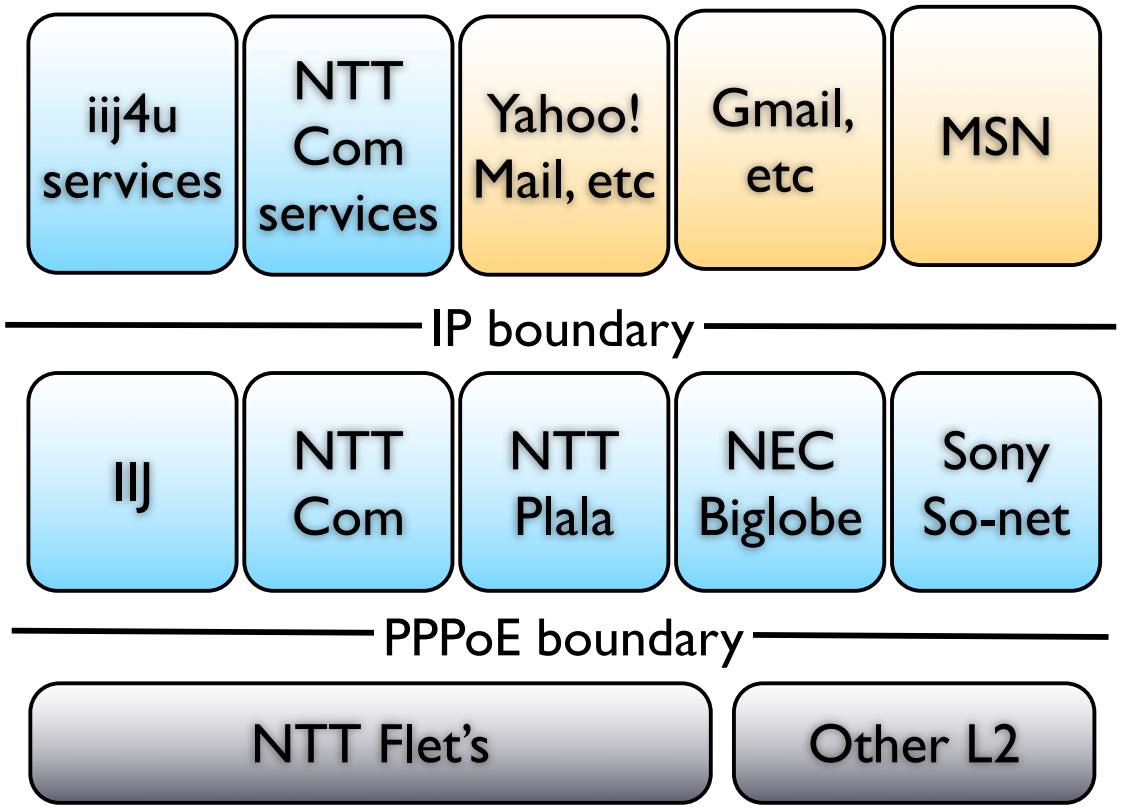
- Not very important from the ISP's service point of view
- IP addresses are managed as an address pool and dynamically assigned during the connection establishment process
  - Even for the fixed IP address service, addresses are managed in a similar way

Why do we need IDs?

- We need IDs to bind two different service entities
- This gives us flexibility in defining a network service
  - e.g. One ppp account can be used for both mobile and fixed connectivity
  - e.g. One customer can have multiple email addresses

Service set examples

- In Japan, the NTT's Flet's service is the major fixed L2 connectivity service
- The Flet's service can be bound to many different ISP's Internet connectivity services using PPPoE
- Users may use any other upper layer ID services on top of the ISP services



Service separation

- Horizontal service separation has been considered good for consumers
  - It provides flexibility in choosing service providers in every layers
  - It encourages the competition of service prices between service providers

Demerits?

- Managing many IDs add more burden to users
- Do Japanese customers choose the service?
  - Basically no
  - Most of the customers are using one of the proposed sets shown by their ISP

Users need to

- Subscribe a L2 service (e.g. Flet's service)
- Subscribe an ISP service (e.g. iij4u) and get PPP account information
- Setup the information to establish a connection to the Internet
- If you are a company employee, register yourself to your company's VPN server and get VPN access account information
- Setup the VPN connection to establish a secure line
- Subscribe an application service (e.g. Salesforce) and get application ID

It is not simple anymore

In mobile environment

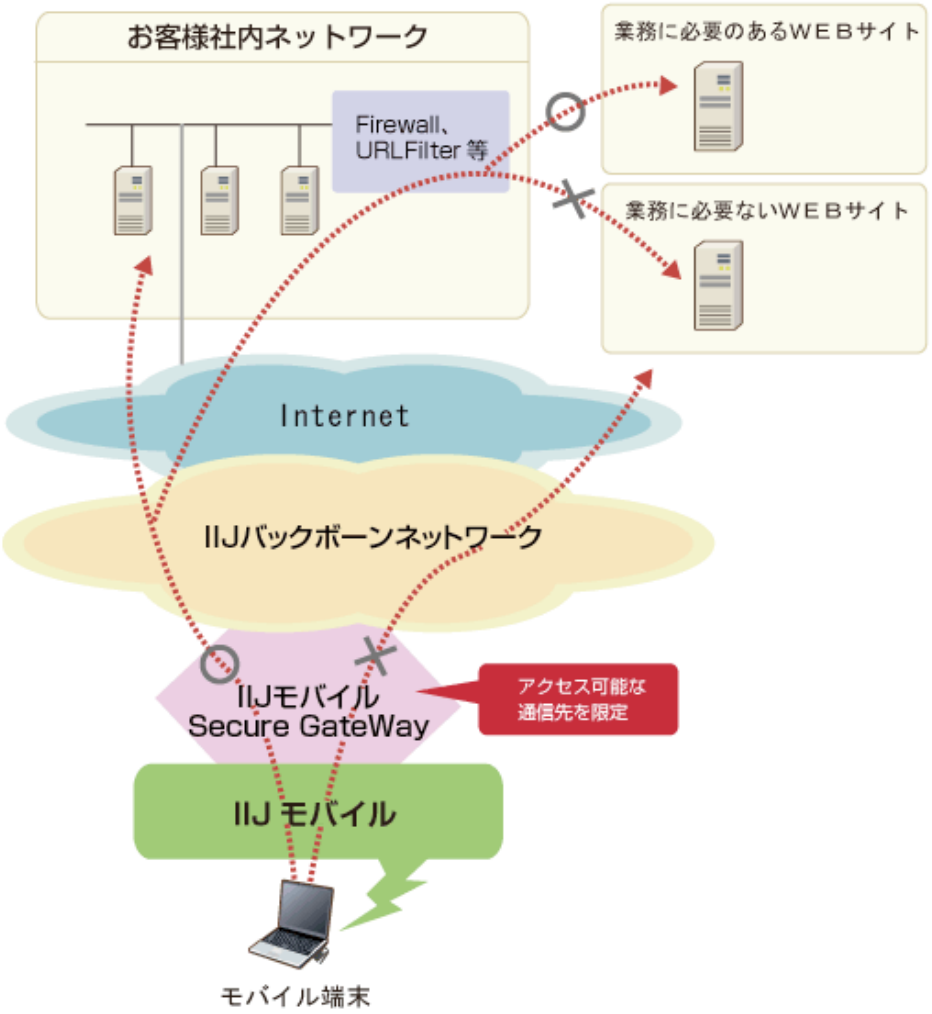
- The situation is a bit different (at least in Japan)
  - Horizontal service separation is not well deployed
  - Mobile Internet service is provided by mobile phone carriers usually

MVNO

- MVNO scheme is recently being deployed in many countries
- In Japan, NTT DoCoMo and E-Mobile are providing MVNO service to ISPs
- MVNO service opened a door to a new style of the mobile Internet service

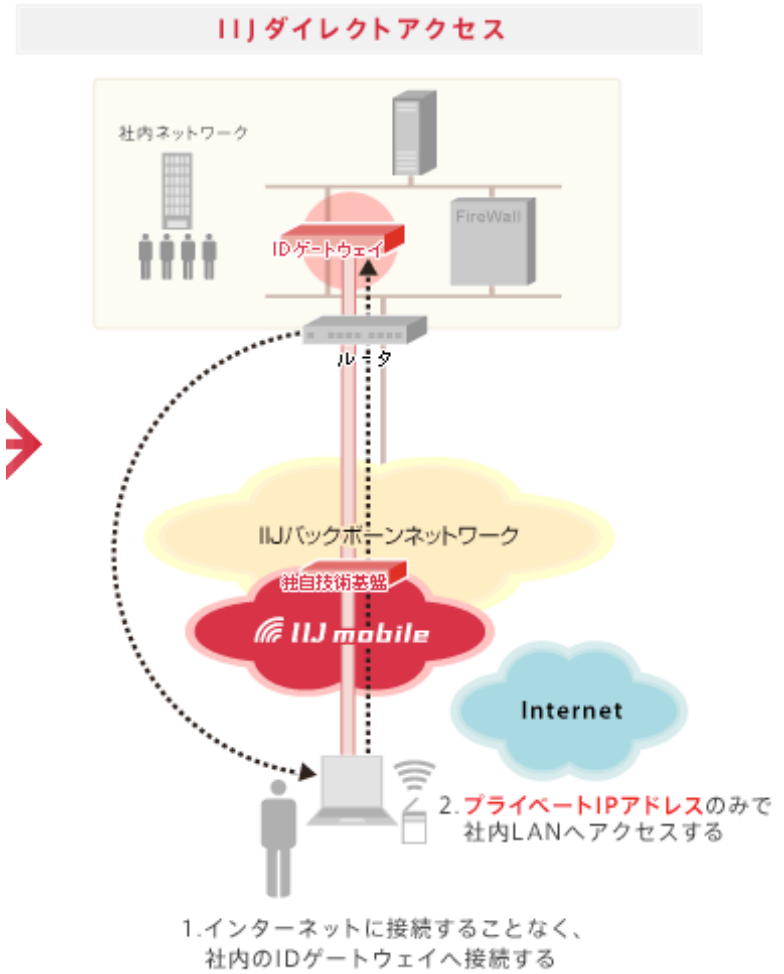
The "IIJ mobile" service

- Use NTT DoCoMo's mobile data network as a virtual network operator
- At this stage, we get the last one mile reachability to users
- Users need to manage many IDs (PPP,VPN IDs)



The "Direct Access" service

- Do not assign a global address on a mobile terminal
- Data is delivered over the L2 data network (using MVNO) and directly received by the security gateway managed by us
- Packets will be tunneled to company's gateway
- Users still need to manage PPP account for authentication



What is good?

- By using the "direct access" service
  - Less security risk, because the user's terminal is NOT connected to the Internet

- What's next?

Integration

- Service Integration makes it easy to manage or use services
  - Especially for people in IT divisions, easiness of management is important
  - Less configuration parameter will give us less configuration mistakes

Back to ISP service

- The main goal is to provide 'reachability to the Internet'
- We are trying to remove the burden required to reach to the Internet as much as possible

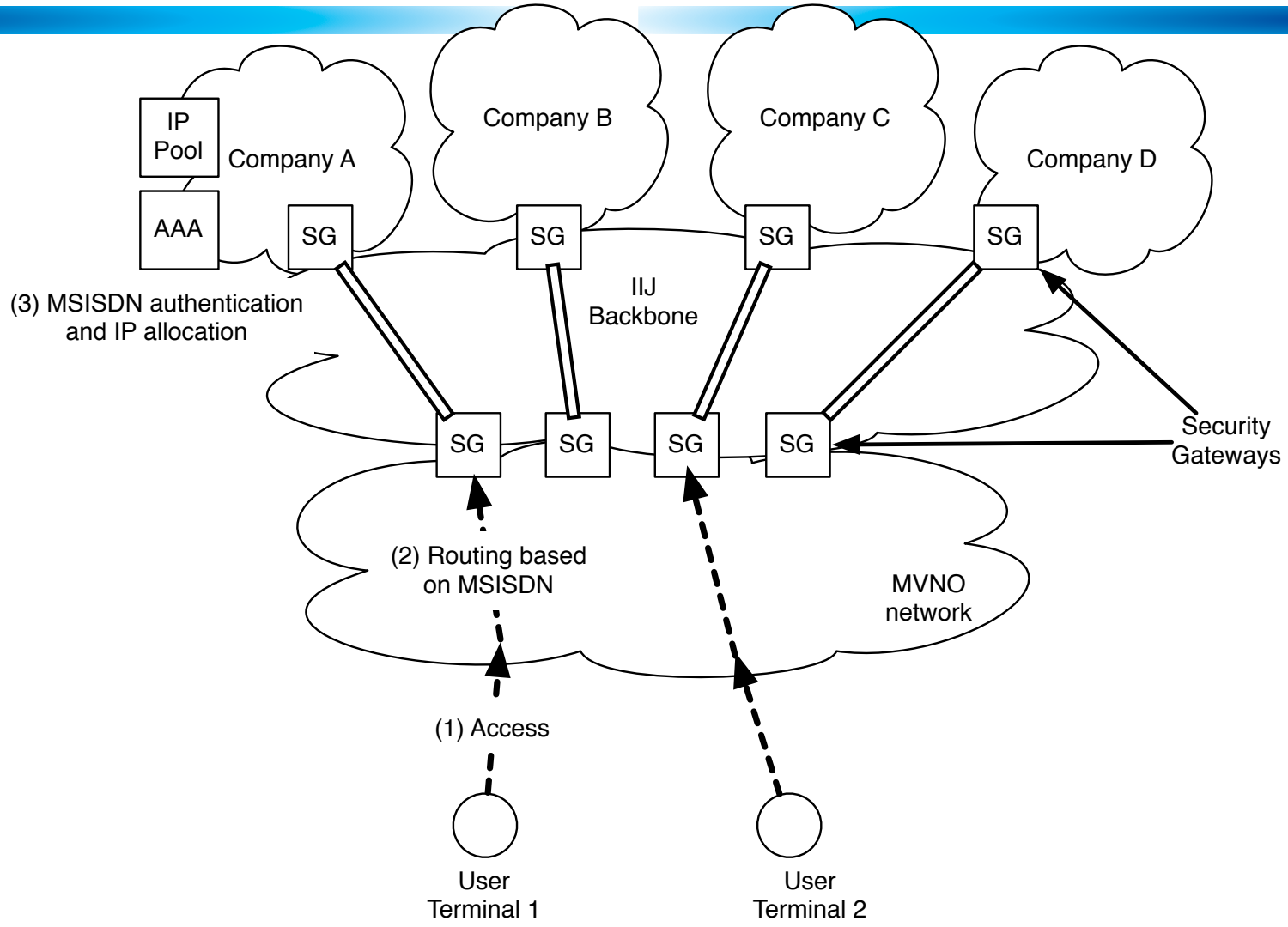
Is PPP account required?

- Under the insecure environment, we need to authenticate ourselves to get grant for service access
  - e.g. the PPP auth over a dial-up connection
- But if we have entire control of the underlying network infrastructure?
  - PPP info doesn't have much meaning if we have alternative authentication info

Is PPP account required?

- We have control
- We are going to remove the PPP authentication phase for our MVNO data communication service customers
- Instead of the PPP information, MSISDN (Mobile Subscriber ISDN) identifiers will be used to authenticate users, and its enough

Concept figure



The ID here is

- The MSISDN identifier is the most important ID for the mobile data communication service
- IP address is just a temporal identifier to provide Internet connectivity from the ISP's point of view

The service boundary is

- Moving up
  - or, at least, we are trying to move it up
- The more the boundary goes to upper layers, the less meanings the internal ID systems have

Are we going *UP* more?

- Currently, the network layer is the service boundary for ISPs
- Some application service providers are operating their services in more higher layers
  - e.g. i-mode service by NTT DoCoMo

We are not so sure what is the best boundary

Is anyone coming *DOWN*?

- It seems that Google is trying to dig the Internet from the upper layers
  - Google ID, several network-supported applications, the scalable application engine, Google phones, and Google optical fiber network service

  We are not sure if they win or lose

To conclude

- ID is one of the parts for us to provide the Internet access to users
  - IP addresses, ppp IDs, Email addresses are just dynamic components of the big system

To conclude

- We need IDs to bind different service components in our internal systems
- The requirements from there is flexibility to compose ISP services using different core technologies

To conclude

- The current service boundary is the IP layer
  - As long as we are here, we don't need more function to IP
  - If we raise the boundary to upper layers, we may need flexibility to the IP layer
    - As we did for lower layers

Thank you!