

*Locators, Identifiers, IP addresses:
A clarification of terminology*



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HIP Research Group Meeting

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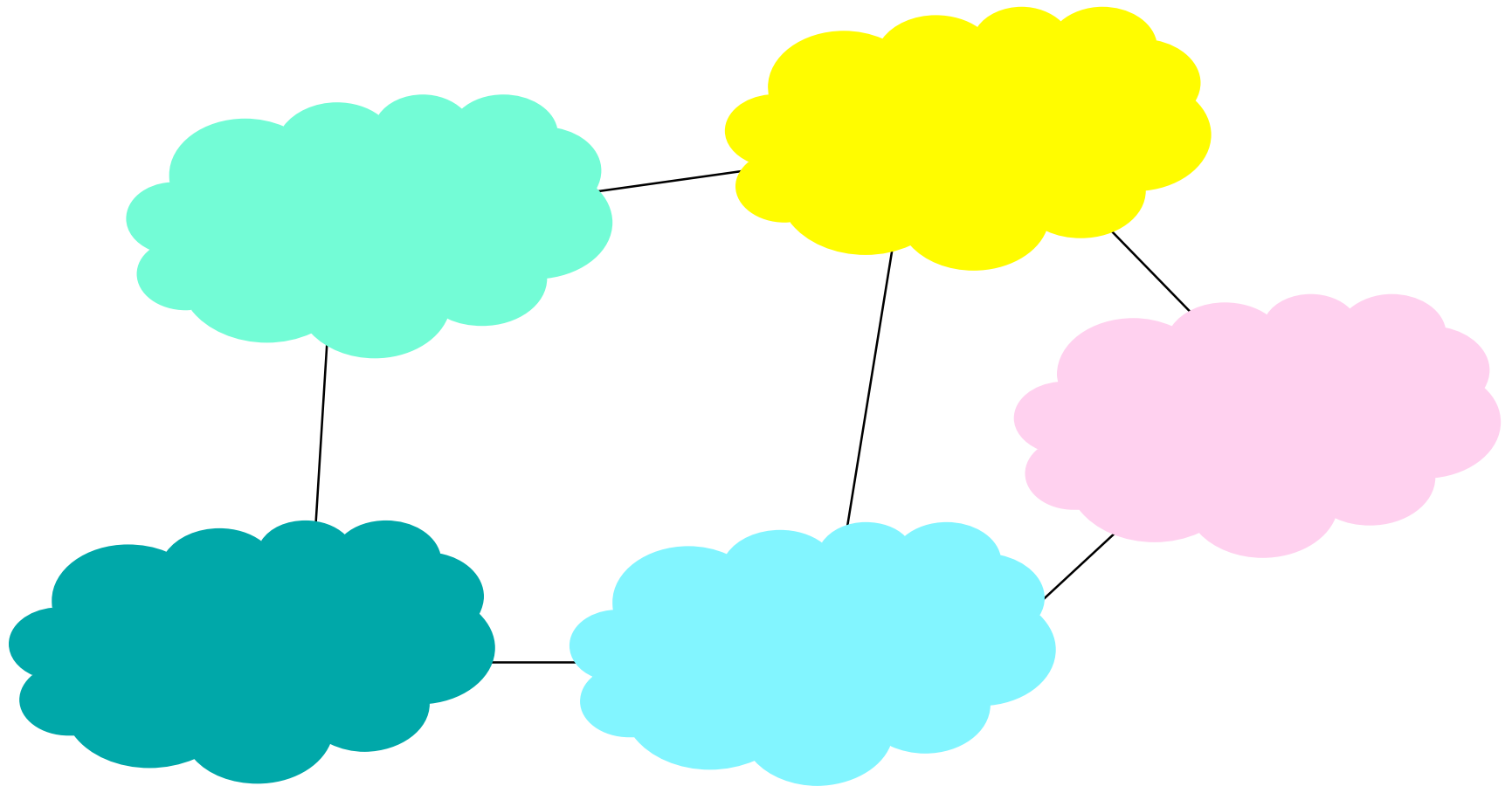
Why I'm here

We've heard a lot about "loc/ID split" talks lately in the context of routing scalability problem

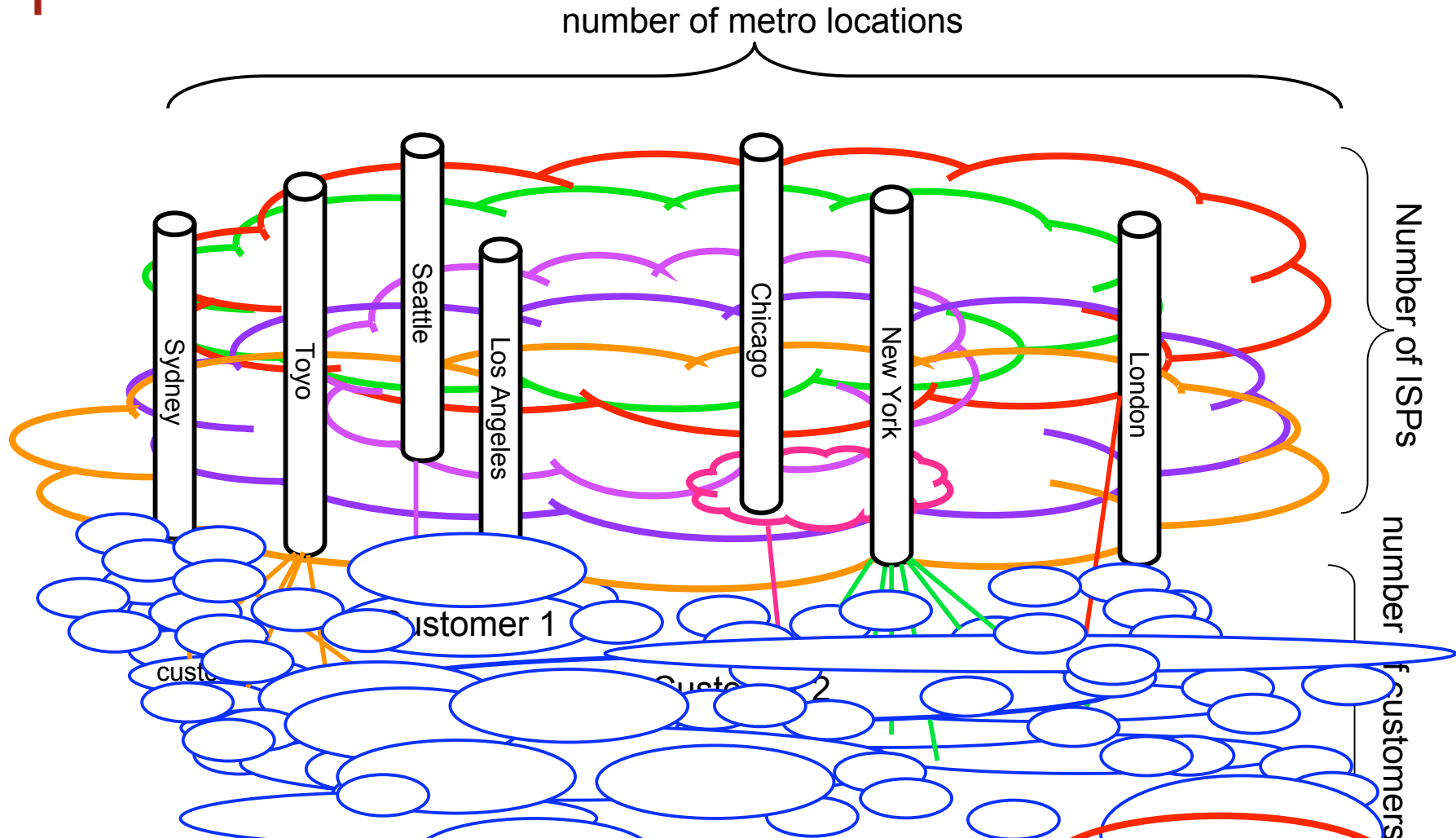
1. Why we face a routing scalability problem
 - and what does that have to do with loc/id split
2. Terminology clarification
 - Locators, identifiers, addresses
 - Exactly what are we separating from what?

Why we have a routing scalability problem

When we draw network graphs, it tends to look like this



But in reality, it is more like this



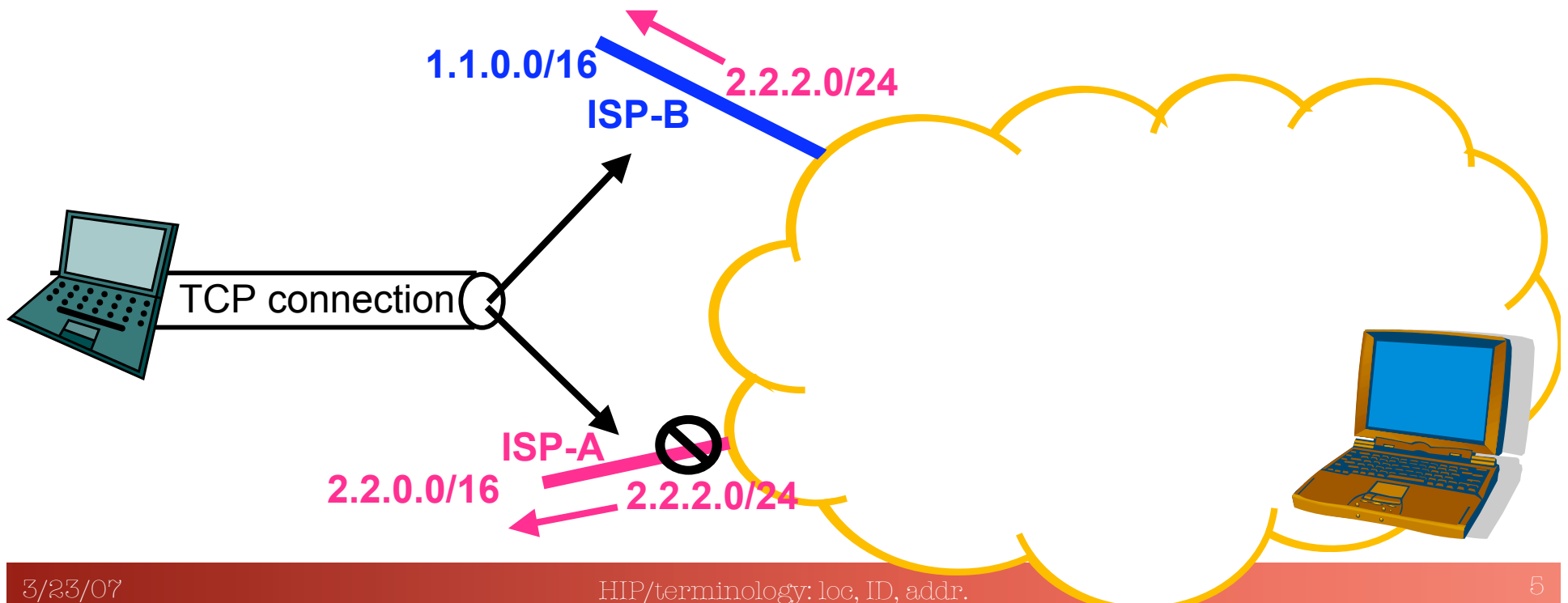
DFZ Routing table size = Function(# of ISPs X # of PoPs X # of user sites)

One example

- User site multihoming

ISPs are not happy!

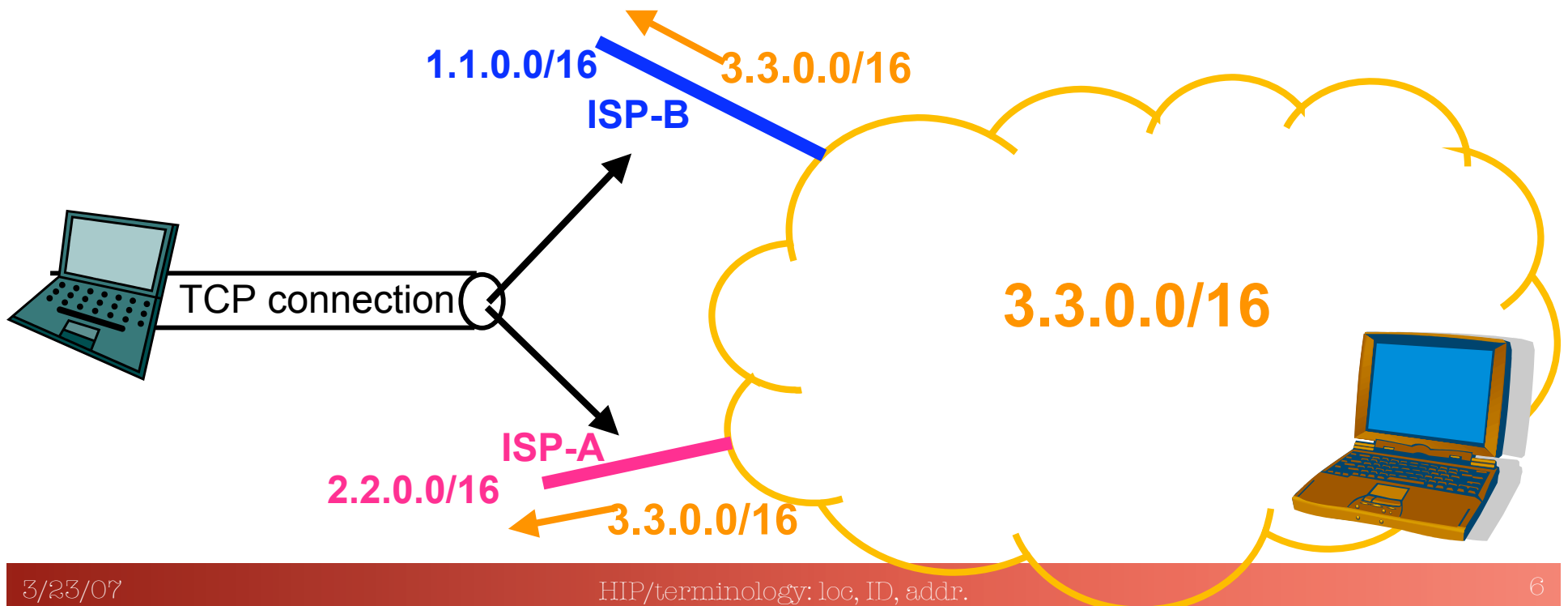
Users are not happy!



One example

- User site multihoming

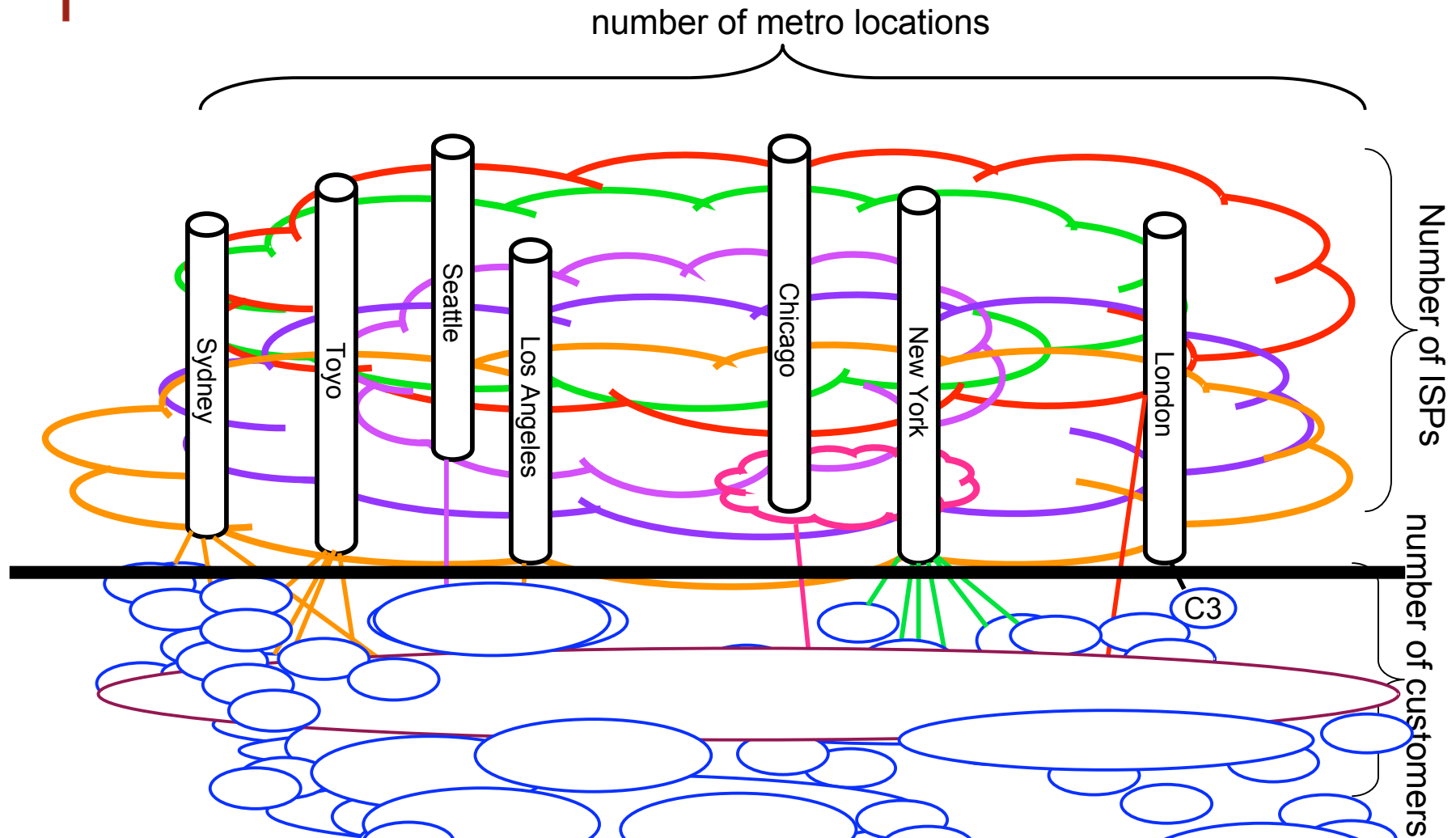
Users would be happy!
ISPs would not be happy!



Tensions between user sites and providers

- User sites want Provider Independent (PI) prefixes
 - Nearly all sites want multihoming
 - no site desires renumbering
 - Providers want provider-based, aggregatable addressing to scale the routing system
- ⇒ Head-on conflict

Proposed solution: separation



DFZ Routing table size = Function(# of ISPs X # of PoPs X # of user sites)

Draft minutes

6th discussion on IP addressing architecture

Thu 6/15/95

Participants: Clark, Deering, Postel, Yakov, Zhang (absent: Ford)

Clark: "There are clearly *two classes of network entities*, subscribers and providers; there may be a gray area but that is not important.

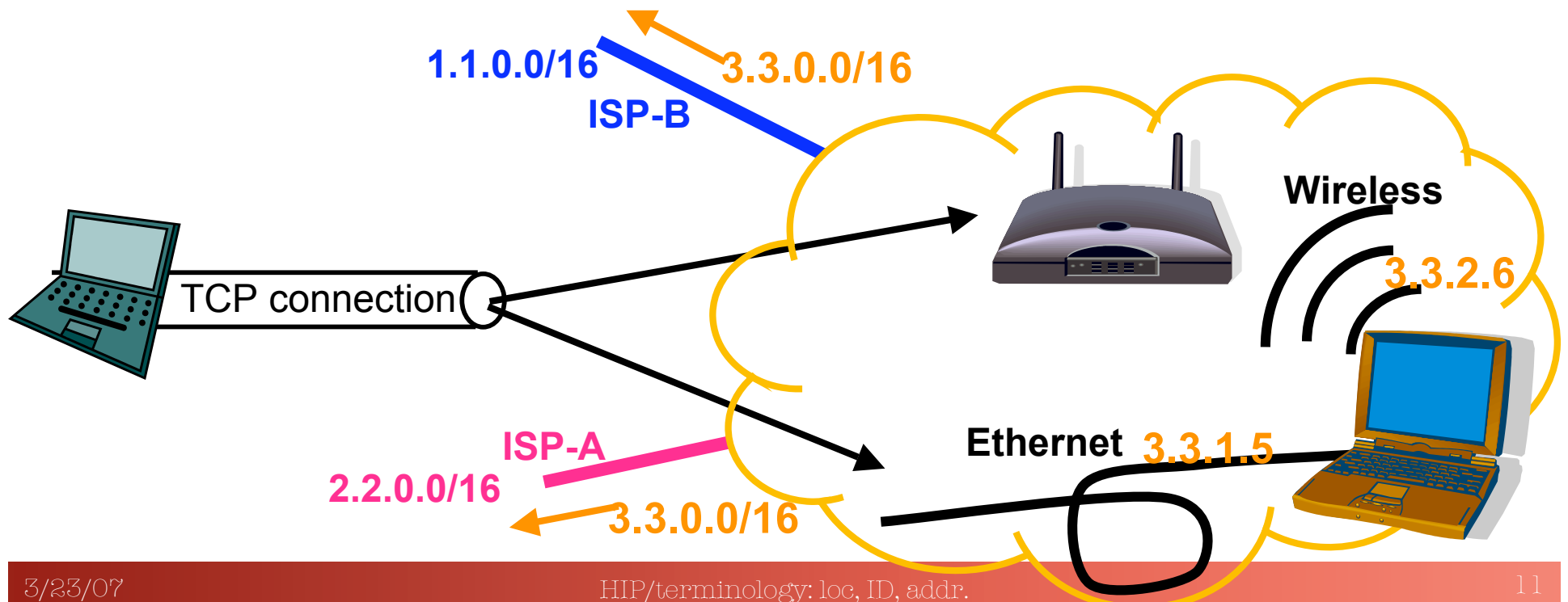
- "As the Internet gets bigger and bigger, *we can no longer make the assumption that subscriber addresses are globally routable*, therefore *they cannot escape without having the provider part attached to it*.
- "The idea is to let those people who are in the business of being internet providers do flat routing among themselves."

Terminology clarification

- What we've shown: the need for separating providers and users address space for routing scalability
- Is this really “loc/ID split” ?

Look at the example again

- TCP uses IP address as part of conn. identifier
- IP address identifies attachment point!



Terminology clarification

- Providers: want topologically aggregatable address prefixes
- Sites: want provider-independent address blocks
- TCP (high level protocols in general): want IP address-independent end-point identifiers

To scale DFZ routing: separate these two

To make TCP conn. survive change of delivery path: *separate* IP-addr and end identifiers (together with other desired features, e.g. security)