INTERNET ROUTING PROTOCOLS

The global Internet topology can be viewed as a collection of autonomous sys tems. An autonomous system (AS) is loosely defined as a set of routers or net- works that are technically administered by a single organization such as a corporate network, a campus network, or an ISP network. There are no restrict tions that an AS should run a single routing protocol within the AS. The only important requirement is that to the outside world, an AS should present a consistent picture of which ASs are reachable through it.

There are three categories of ASs:

1. Stub AS has only a single connection to the outside world. Stub AS is also called single-homed AS.
2. Multihomed AS has multiple connections to the outside world but refuses to carry transit traffic (traffic that originates and terminates in the outside world). Multihomed AS carries only local traffic (traffic that originates or terminates in that AS).
3. Transit AS has multiple connections to the outside world and can carry transit and local traffic.

For the purpose of AS identification, an AS needs to be assigned with a globally unique AS number (ASN) that is represented by a 16-bit integer and thus is limited to about

65,000 numbers. We show later how ASNs are used in exterior routing. Care must be taken not to exhaust the AS space. Currently, there are about 3500 registered ASs in the Internet. Fortunately, a stub AS, which is the most common type, does

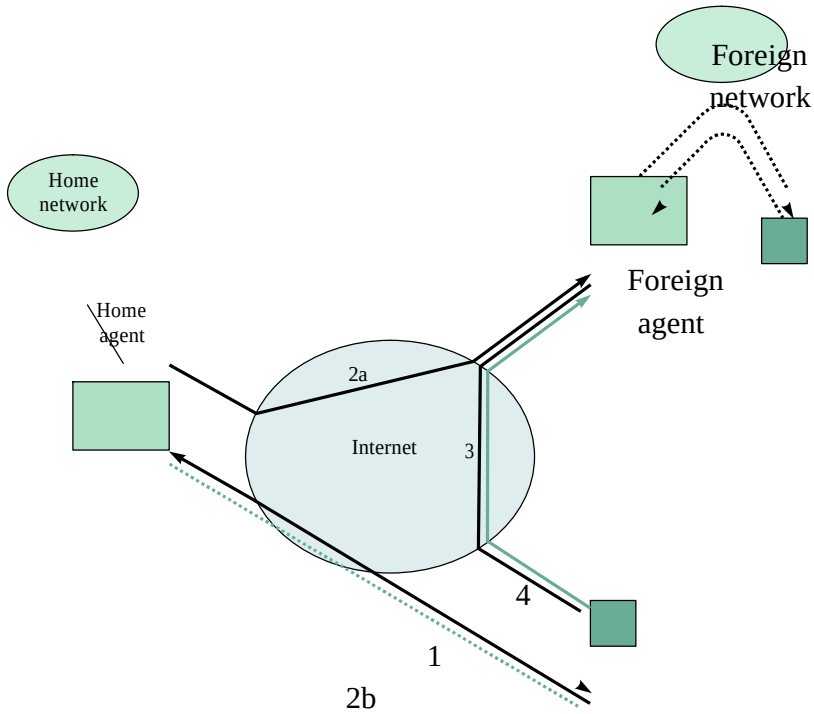

FIGURE 4.31 Route optimization for mobile IP

not need an ASN, since the stub AS prefixes are placed at the provider's routing table. On the other hand, a transit AS needs an ASN. At present, an organization may request an ASN from

the American Registry for Internet Numbers (ARIN) in North America. Routing protocols in the Internet are arranged in a hierarchy that involves two types of protocols: Interior Gateway Protocol (IGP) and Exterior Gateway Protocol (EGP). IGP is used for routers to communicate within an AS and relies on IP addresses to construct paths. EGP is used for routers to communicate among different ASs and relies on AS numbers to construct AS paths. In this section we cover two popular IGPs: Routing Information Protocol and Open Shortest Path First.

Source : http://elearningatria.files.wordpress.com/2013/10/cse-vi-computer-networks-ii-10cs64-notes.pdf