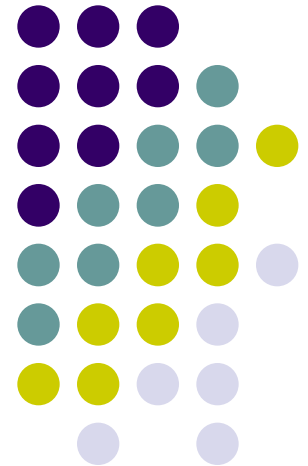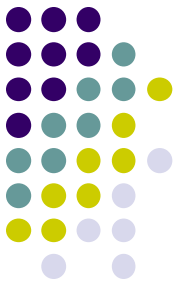# IPv6 Related Network Layer Techniques

Dr. Adnan K. Kiani
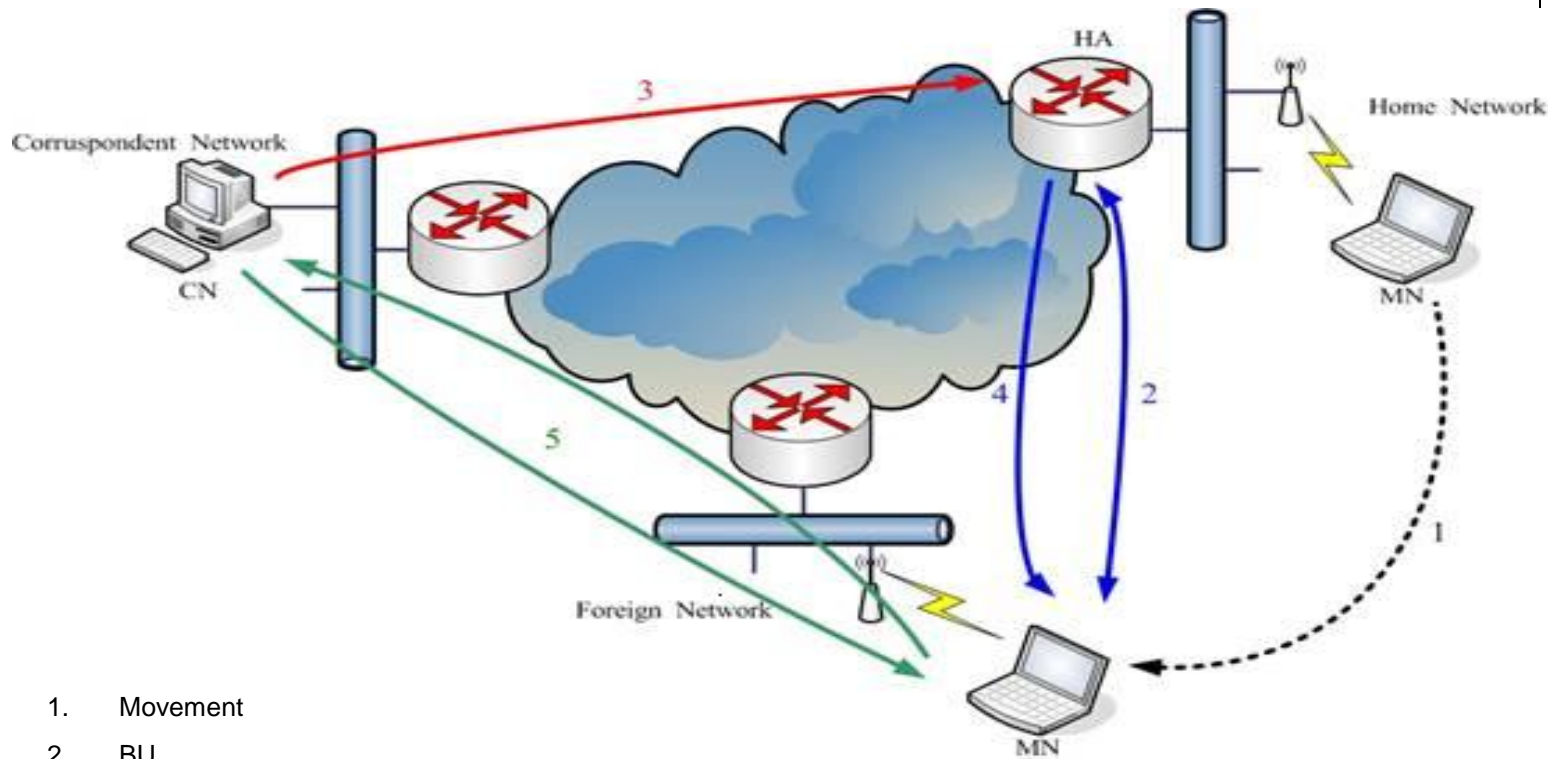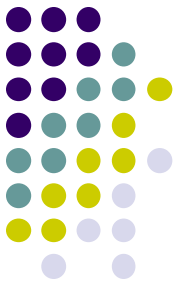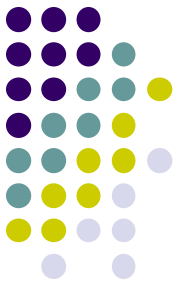
Network Layer Issues

- Mobility.
- Multi homing.
- Security.
- Routing.

Mobility

1. Movement
2. BU
3. MN destination packets
4. BA
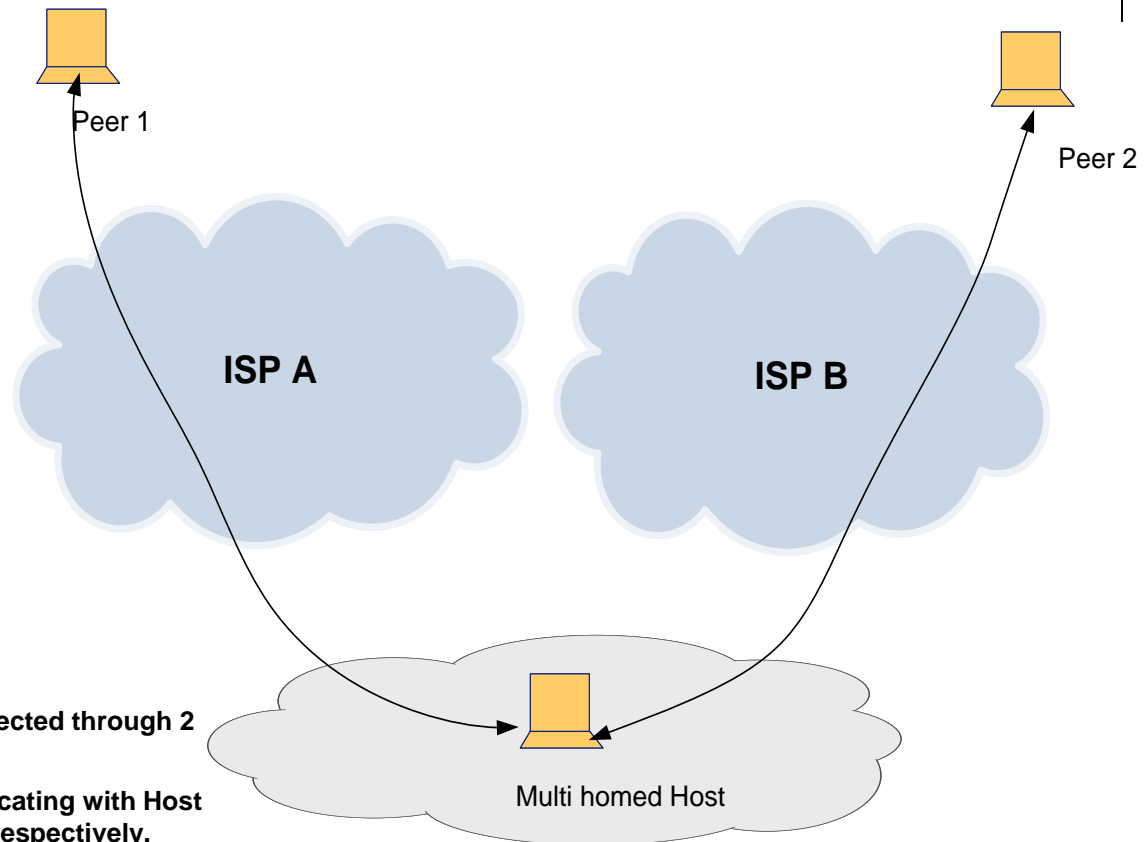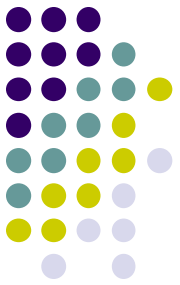5. Route Optimization two-way communications

Courtesy: ikn.tuwien.ac.at

# Mobility (Cont'd)

- MIPv4 vs. MIPv6.
  - No Foreign Agents
    - Availability of Enough Addresses in IPv6
  - Route Optimization (RO) Mode.
    - Home Address Destination Option Header.
    - Type 2 Routing Header.
  - Address Auto configuration
 - Neighbour/Router Discovery

Multi homing with IPv6

Peer 1

Peer 2

ISP A

ISP B

Multi homed Host

- **Multi homed Host connected through 2 ISPs.**

- **Peers 1 and 2 communicating with Host rhrough ISPs A and B respectively.**

Multi homing with IPv6 (Cont'd)
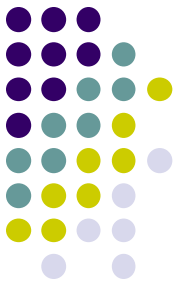
- Multi Interfaced Devices
  - Multiple paths to the internet.
  - Ubiquotous Access
  - Quick Failure Detection and Recovery
  - Session Survivability

Security Improvement with IPv6
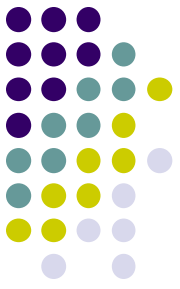
- IPSec Integral Part.
- Authentication Header (AH).
  - Authentication and Integrity
  - Eliminates a significant class of network attacks in IP source routing.
- Encapsulating Security Payload (ESP) Header.
  - Provides integrity and Confidentiality to IPv6 Datagram.
- Leveraging the hop limit.

IPv6 Routing
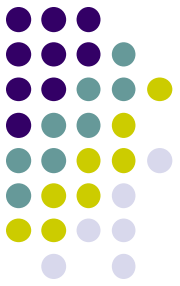
- Fragmentation at End points
- Source Routing
- Flow label
- Cisco effort.
  - Locator/Identifier Separation Protocol (LISP)
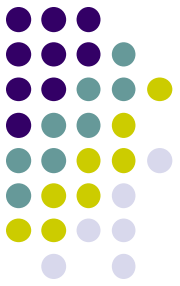
The way forward

- Tremendous research potential.
- Regional Interest.
- Scarcity of experts so get involved.