

DHT-Oriented Architecture: A Prototype

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MIT 6.824 Project Demonstration
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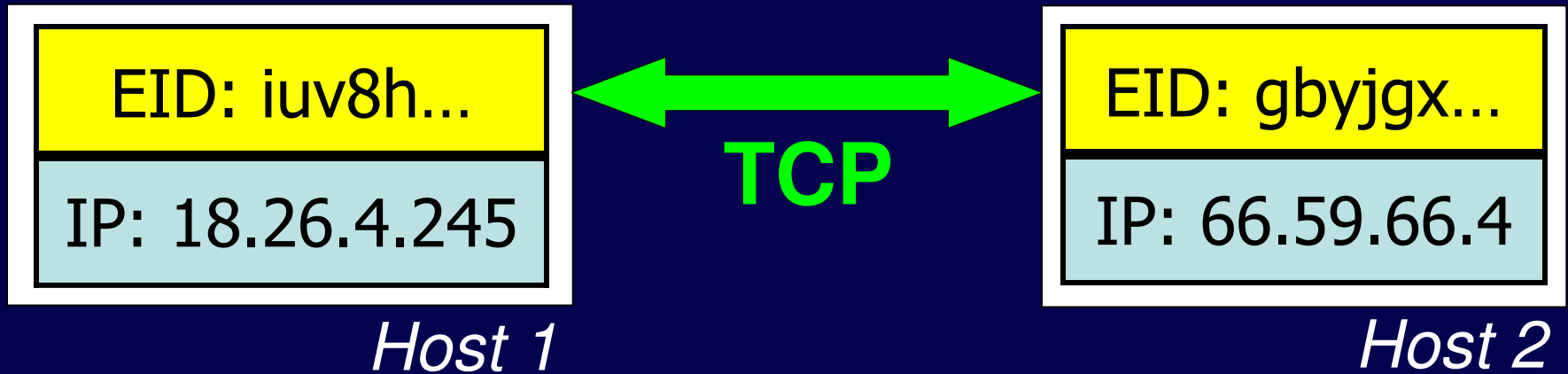
Old Goal: Separate Location and Identity

- An IP address conflates:
 - Network location
 - Identity, sort of
- So?
- Well, that means:
 - 1) Mobility, multihoming, renumbering awkward
 - 2) Tough to reach hosts behind NATs

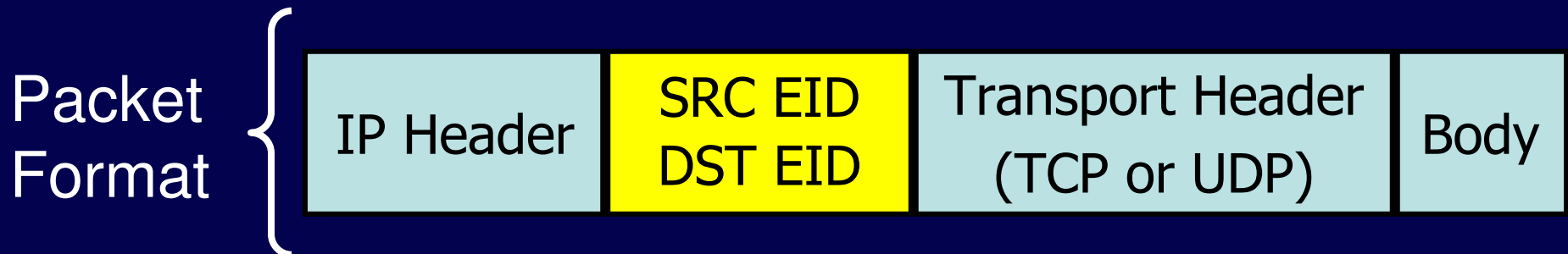
Subject of Demo

Recent Proposal: DOA

- Hosts get flat identifiers (EIDs)



- Transport connection bound to EID pair
- IP addr gives only routing information



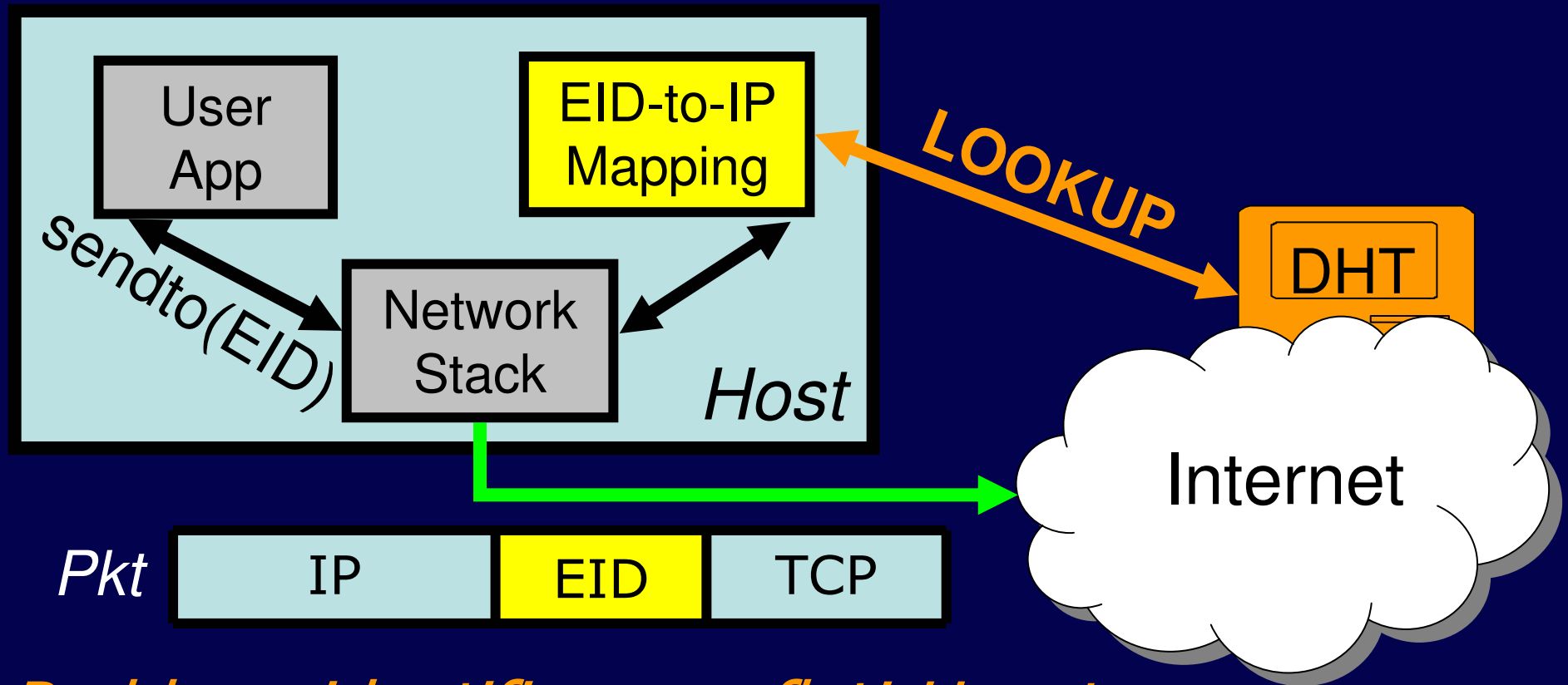
Recent Proposal: DOA, cont'd

IP Header	SRC EID DST EID	Transport Header (TCP or UDP)	Body
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- EIDs passed out of band; map to an IP addr
- Assume a mapping service in the sky:

EID	IP Address
8iabv2hmbsipse49qertgb5muury79tk	66.59.66.4
gbyjgxf6pkninur7jirpzjc3ftwpvfpd	18.26.4.245
iuv8h9r7qxycwkfh4whcsd3ufw4acp6i	18.26.4.245

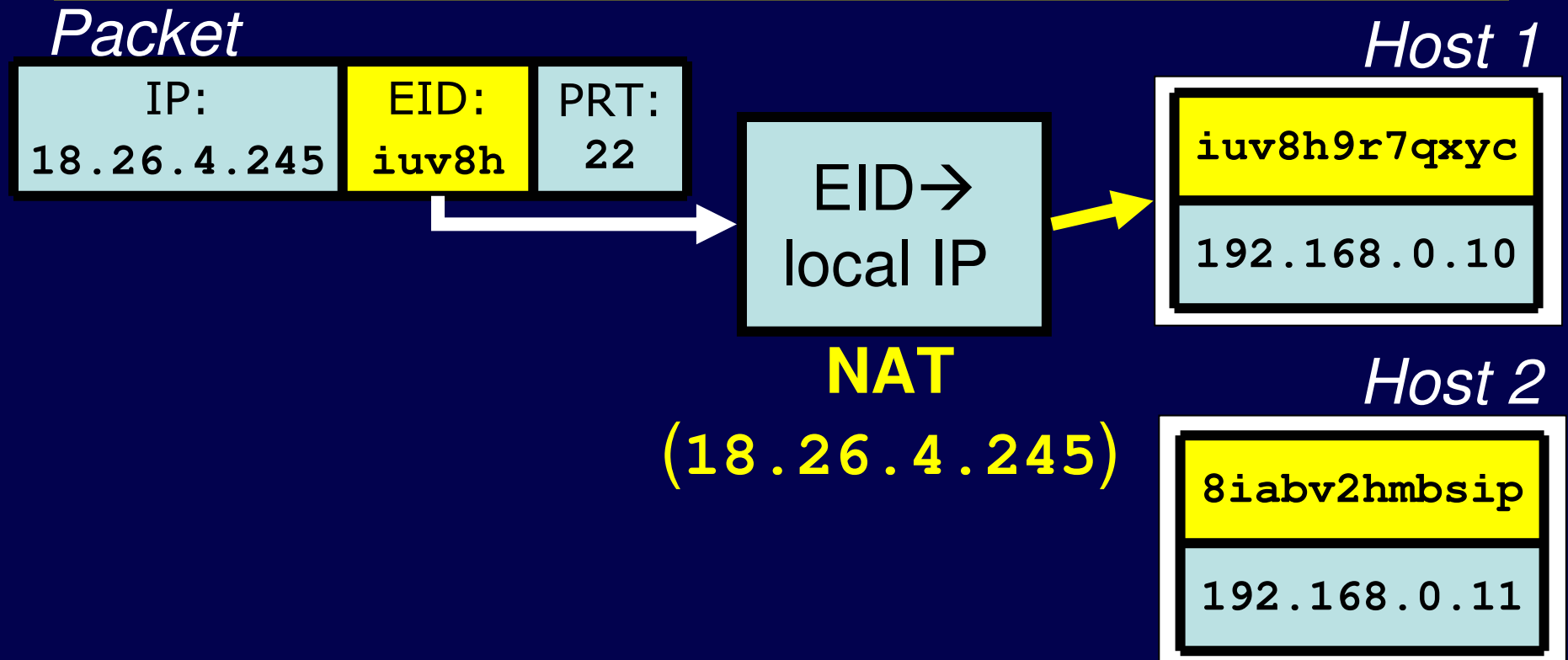
DOA in a Nutshell



Problem: identifiers are flat! How to map them to actual IP addresses?

Claim: DOA addresses NAT difficulties

Reaching NATed Hosts in DOA



- EIDs of NATed hosts map to NAT's IP
- NATs use the host identifier, EID, to demux
- Many servers behind NAT on same TCP port

Our High-Speed, State-of-the-Art Cluster

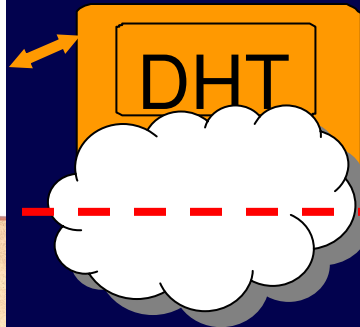


Demo of DOA Prototype

```
> ssh iuv8h9r7q.DOA
```



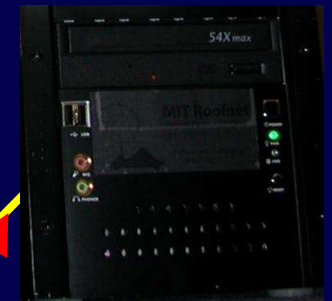
Client



NAT 1
(18.26.4.245)



NAT 2



Host 1
iuv8h...



Host 2
8iabv...

Conclusion

DOA:

- 1) permits the location/identity split, which:
 - supports multi-homed hosts (not discussed)
 - accommodates hosts behind NATs
- 2) uses a DHT to map flat EIDs → IP addrs
- 3) has no chance of ever being deployed