

# Identifier Locator Addressing ILA

Tom Herbert  
<tom@quantonium.net>

Kalyani Bogineni  
<kalyani.bogineni@verizonwireless.com>

# Goal

Provide seamless mobility for multiple use cases using highly efficient identifier/locator techniques

# Use cases

- Mobility
- Data center virtualization
- Network virtualization (multi-tenant)
  
- Converged network (all three of above)

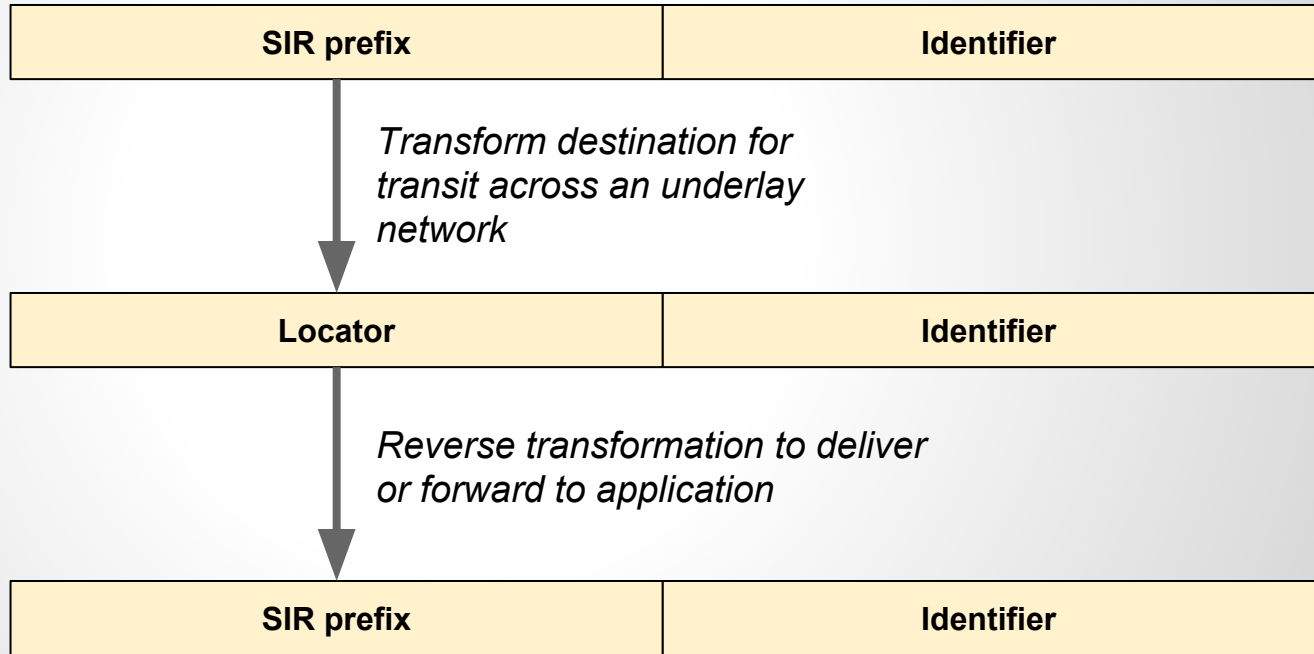
# Problems

<b>Problem</b>	<b>Applicable Use cases</b>
Encapsulation is perf. and overhead hit	General problem
Tunneling considerations	General problem
Identity tied to location	General problem
Support for “alternate” protocols	Mostly virtualization
Privacy in addressing	Public network problem
Mobile anchor points	Mobile
Low latency application (AR/VR) support	Mobile

# Addressing and transformations

Standard Identifier  
Representation (SIR).  
Address visible to apps

Locator address. Routes  
packets to physical  
location of logical node



# Salient properties of ILA

- Identifier/locator split
- Performs address transformation (not NAT)
- No wire overhead (no encap or EH)
- Contained within network layer
- Transparent to the endpoints and network

# Scope

- Data plane
  - Process of transformation
  - Checksum neutral
  - Address encodings
- Control plane
  - Mapping system (identifier to locator mappings)
  - Manage by standalone protocols
  - Leverage existing 3GPP control plane

# Limitations

- ILA is IPv6 only
- ILA is not extensible
- Complexity of data plane vs. control plane
- Does not naturally support multicast
- ICMP error handling needs consideration



# Considerations

- Scalability
- Security
- Privacy
- DOSability

# Scalability aspects

- Number of mappings in the system
- Rate of update to mappings
- Throughput dataplane
- Managing state in a mapping system
- Mapping caches

# Security aspects

- Mapping system contains sensitive PII
  - Identity: IP address to device (user for personal dev)
  - Geo-location: of device and hence possibly user
- Mapping system needs to be secure
  - Secure control protocols
  - Limit visibility of data (no global mapping system)
  - Law enforcement considerations
- Interdomain solutions

# Privacy aspects

- Privacy in addressing
  - Privacy issue with prefix assignment (draft-herbert-prefix-address-privacy)
  - Privacy vs. scalability
- Locator privacy
  - Location likely implies location
  - Third parties can't see such locators

# DOSability

- Mapping cache
  - Potential target
  - Cache driven by a third party
  - Need quantitative explanation for an DOS mitigation

# Virtualization use case

- Datacenter virtualization
  - Every task gets its own IP address
  - Eventually *everything* gets address
  - Everything is mobile or location independent
  - Performance is critical
- Network virtualization
  - Like datacenter virtualization
  - Tenant isolation
  - Common services (with resorting to NAT)

Thank you!

# References

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