Geolocation Compass:
Geolocalized Data Registry and Forwarding for ICN Networks

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Abstract and Background

Namespace forwarding in ICN:

- Benefits: provides information centric view instead of network or host centric view
- Drawbacks: network-wide advertising of names of new or changing services difficult to scale

Proposal solves aforementioned issue by:

- Registering services to local geolocation-aware nodes
- Including geolocation information in Interest
- Forwarding Interests based on geolocation coordinates and range

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Geolocation Compass Overview

Producers:

Register geolocalized services to Geolocation Compass nodes with geolocation coordinates, serving radius, and other parameters

Consumers:

Request content by providing POI and/or ROI (geolocation coordinates plus search radius)

Geolocation Compass:

Forwards consumer requests to nearest geolocation nodes that have registrations for the service that can satisfy the consumer's Interest

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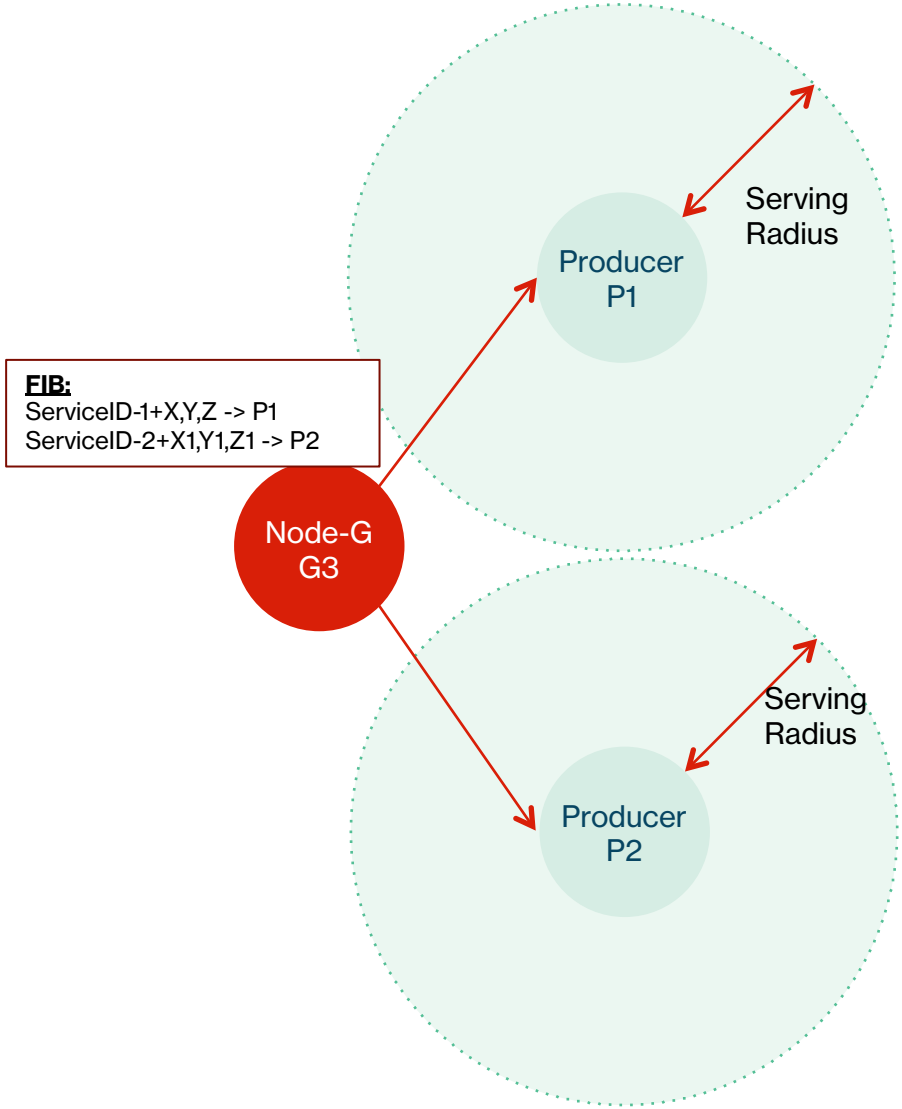
Geolocation Compass Service Registration



Example: Registration Table on G3

Service Identifier	Geolocation Coordinates	Serving Radius (meters)	Registration Validity (Epoch)	Producer ID
Temperature	x,y,z	100	1489516340+600	P1
	x1,y1,z1	100	1489516340+600	P2
Humidity	x1,y1,z1	100	1489516340+600	P2
Business Hours	x2,y2,z2	1000	1489516340+43200	P3
Traffic Conditions	x4,y4,z4	800	1489516340+60	P5

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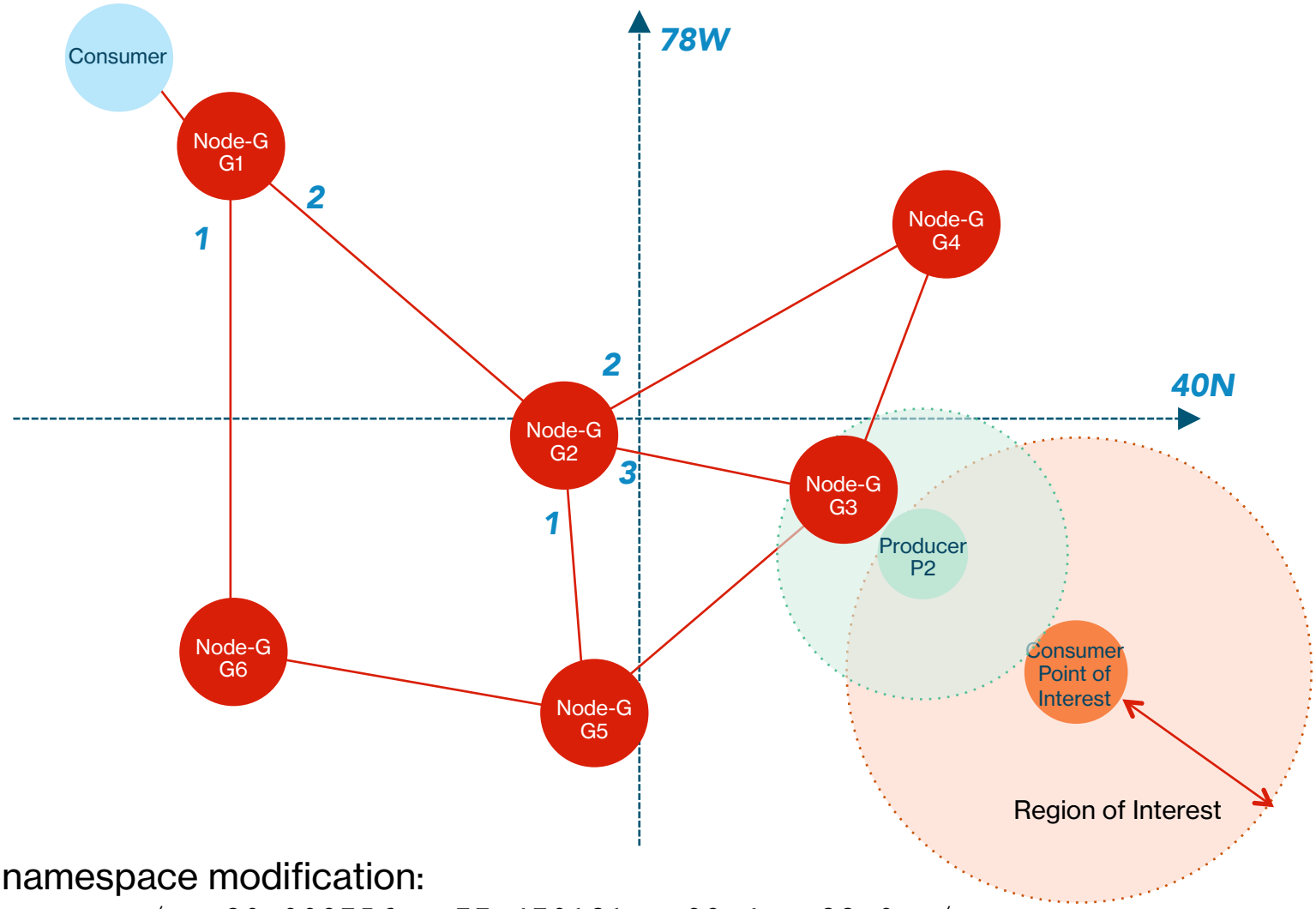
Geolocation Compass Forwarding



Example of namespace modification:

`/GEO/BusinessHours/GC=39.008756,N,77.470131,W,82.4,M,33.9,M/ACME`

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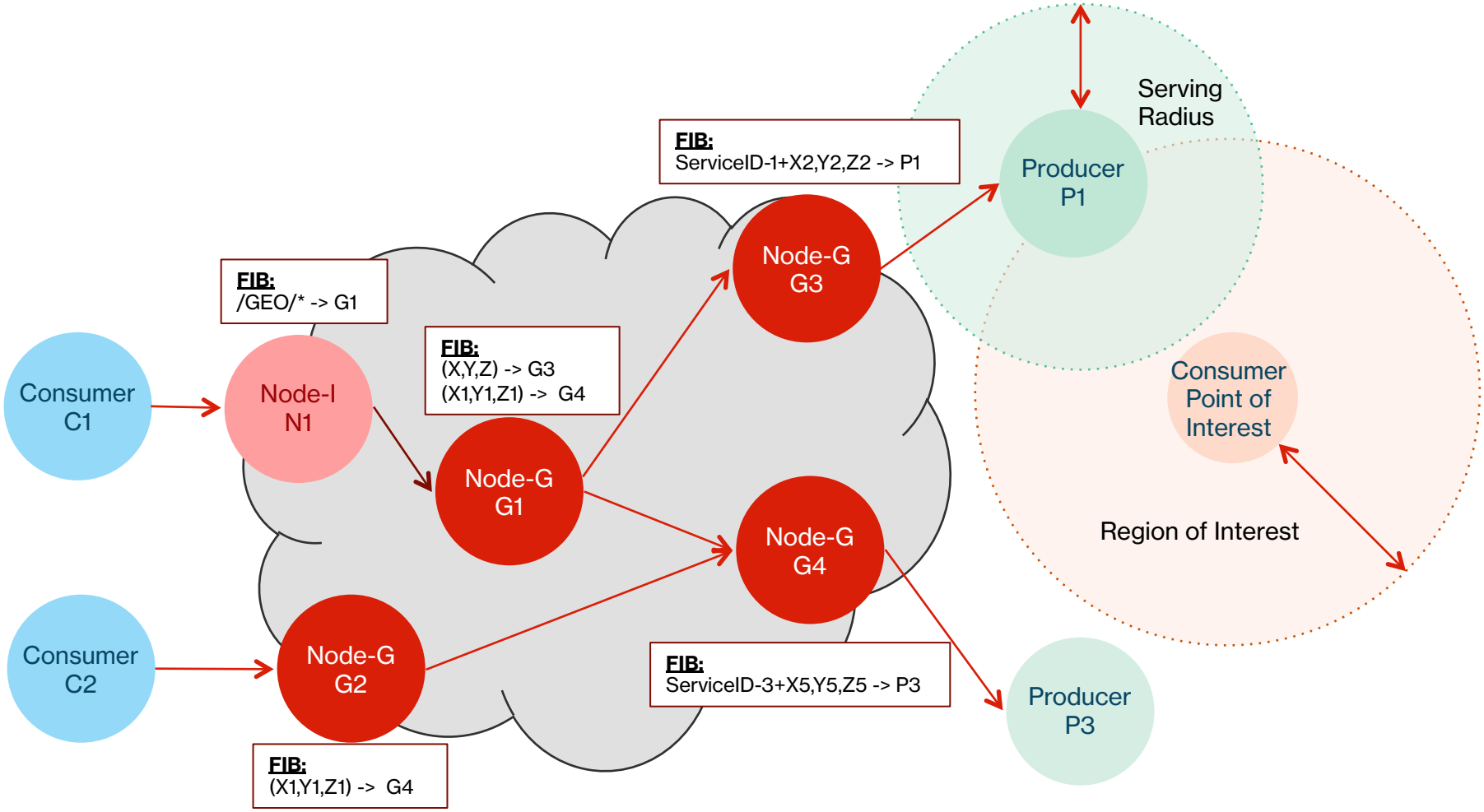
Geolocation Compass Forwarding



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Summary

Geolocation Compass:

- Provides a scalable and distributed mechanism for efficient access to real-time relevant and geolocalized data
- Consumer requests for content are forwarded using geolocation-based routing algorithms to Compass nodes closest to relevant Producers
- Namespace modifications are proposed to facilitate routing from non-Compass nodes to Compass nodes and between two Compass nodes as well
- Producers can advertise services through Compass nodes using a highly scalable, reliable and extensible Registration mechanism

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Thank you.

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