

# IXPs & Economic Development: Model, Metrics, Evidence

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# IXPs: the Normative Model

- **Neutral facility:**

anyone may join, uniform membership terms, costs

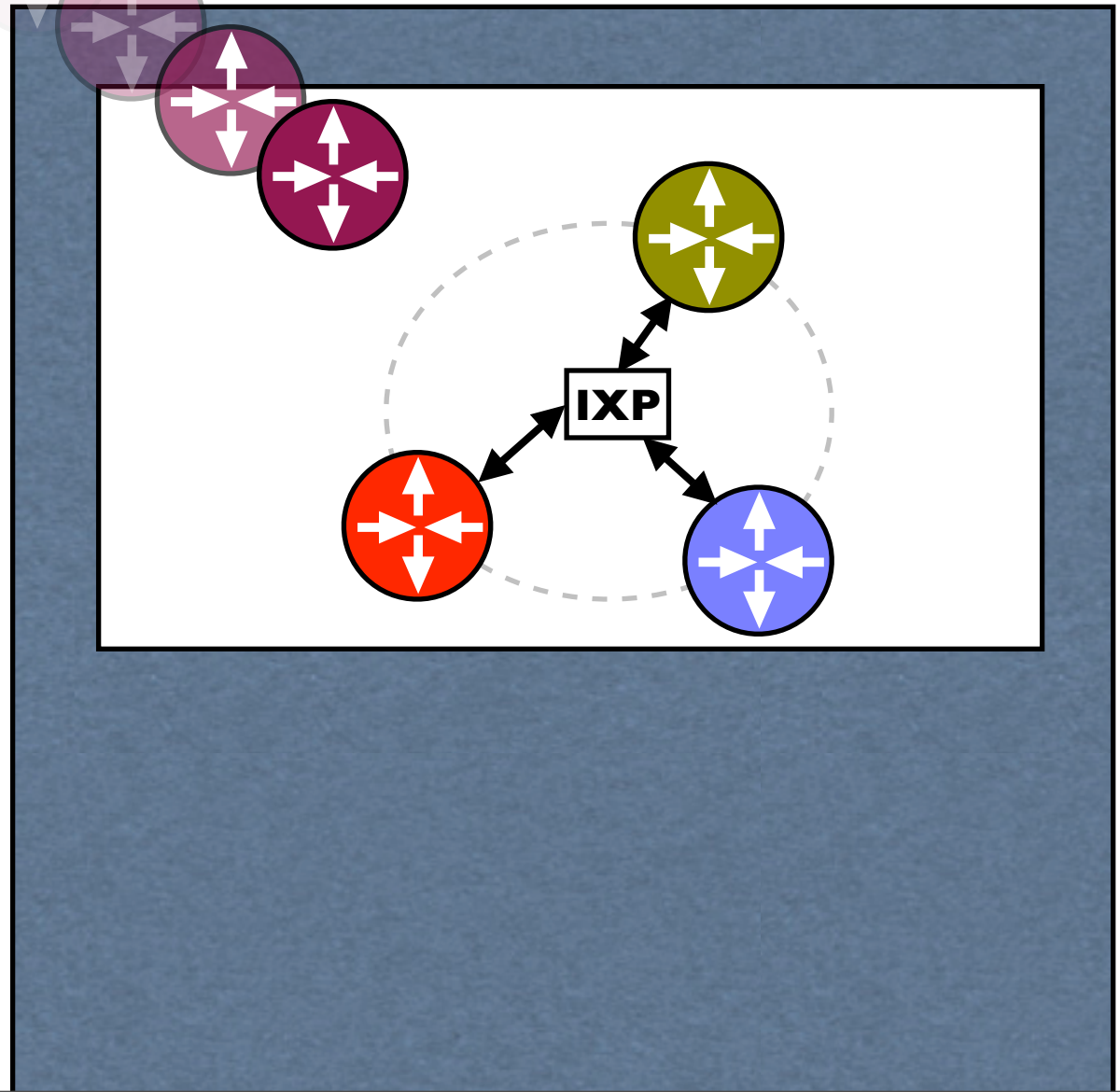
- **Open contracting:**

Membership does not require a commercial or interconnection relationship with anyone in particular

- **Reduced cost of operation:**

Assuming three or more member networks, joint costs of IXP participation are less than meshed, decentralized bilateral interconnections between the networks

- **That's it (?)....**



# IXP Impacts *ala the Normative Model*

- **Direct impacts:**

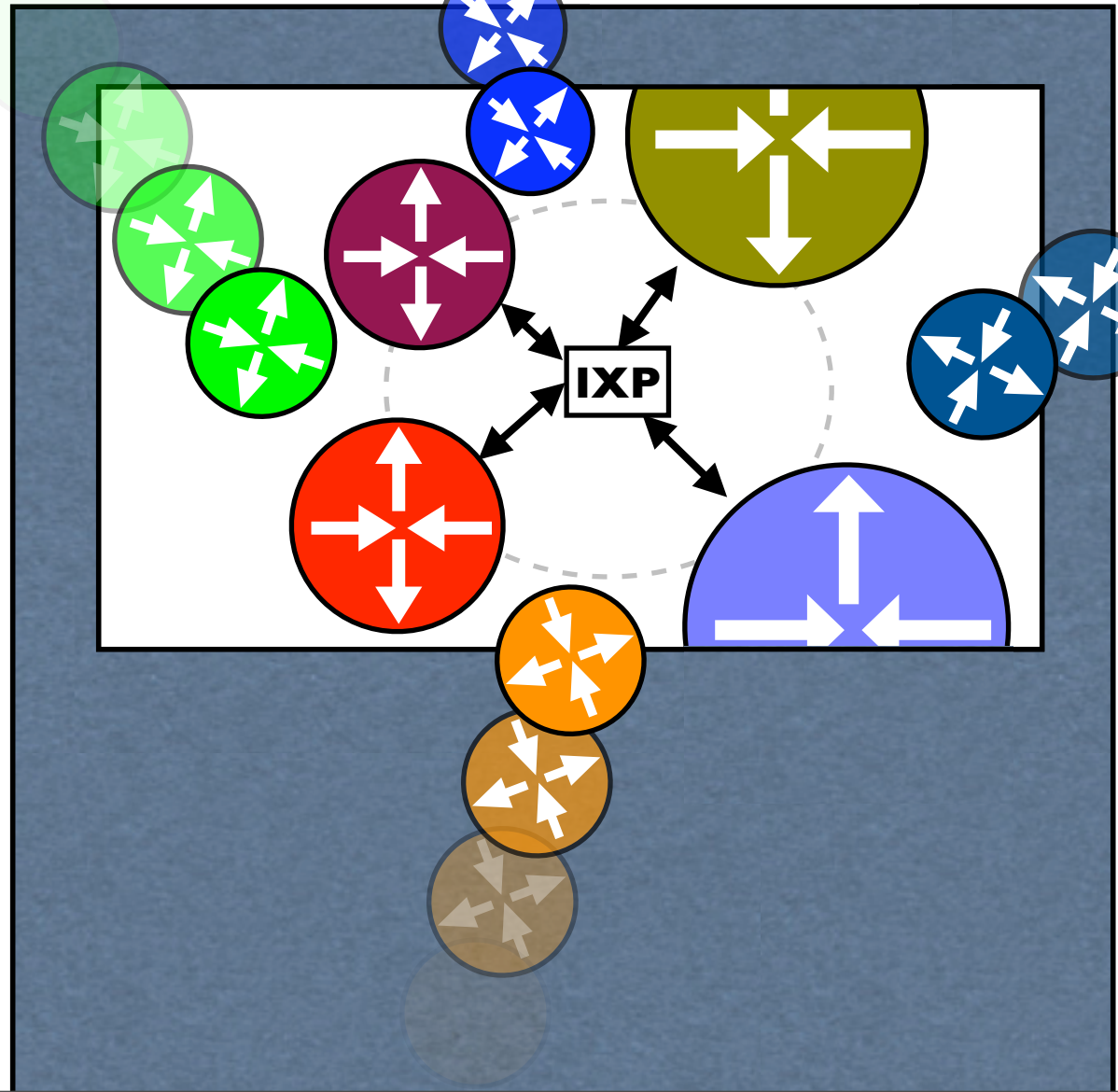
Members grow; new entrants emerge and join; X-Cs and traffic exchange between members expands; service improves

- **Indirect impacts:**

External service providers are attracted; more choice and competition accelerates growth throughout the entire market (nonmembers too)

- **Induced impacts:**

Local services diversify; reduced costs and improved performance attracts some offshore production back home; share of local content and services, and eventually foreign demand for local services, expands...



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- **Local Measurement**

IXP membership records, traffic exchange stats, interconnection matrices (?)

- **Global Measurement**

Economic interpretation of the Internet routing table over time, using the Route Views Archive:

**Available metrics include:**

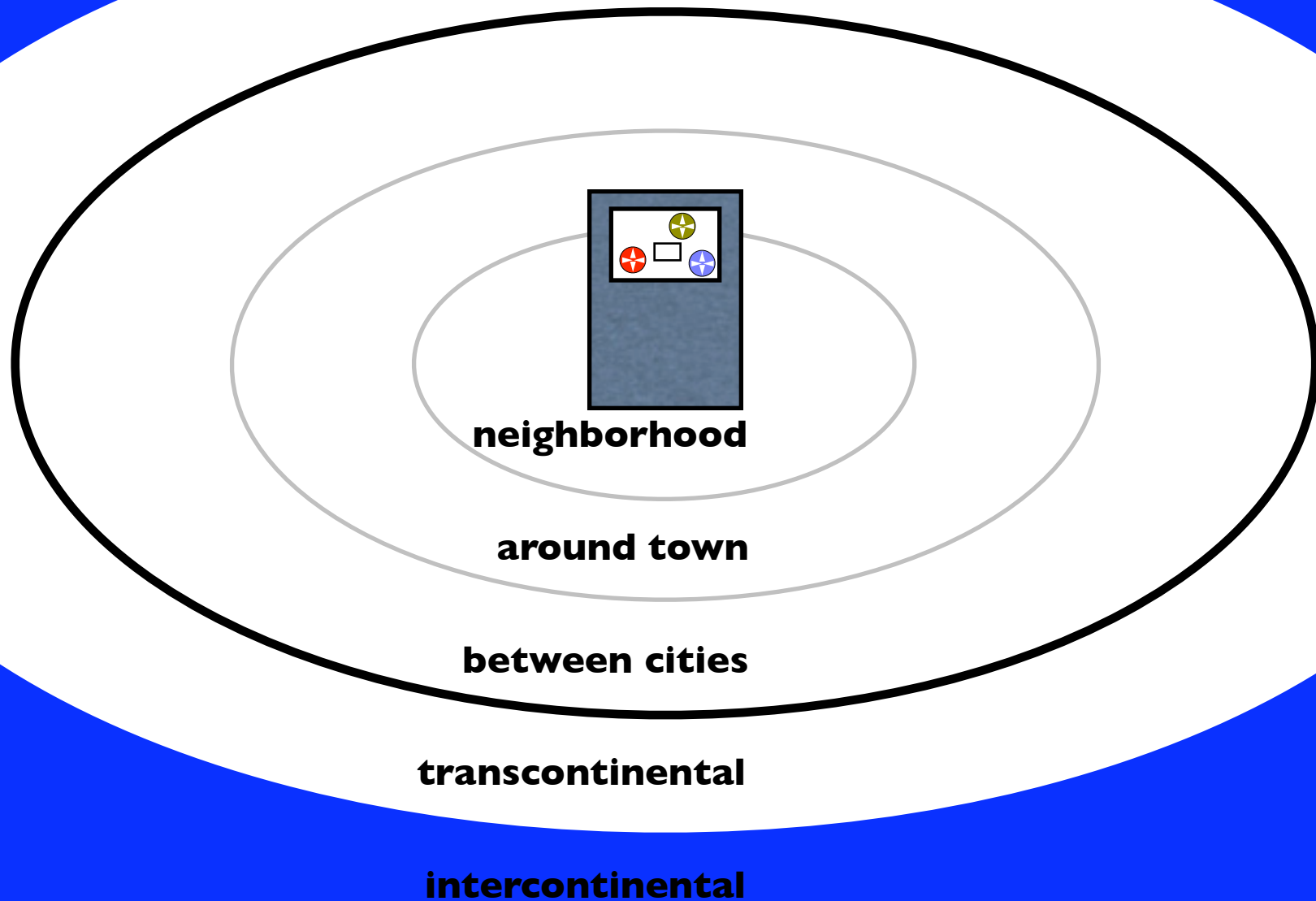
Enterprise/AS-level Internet production (total IP originated);

Total national Internet production;

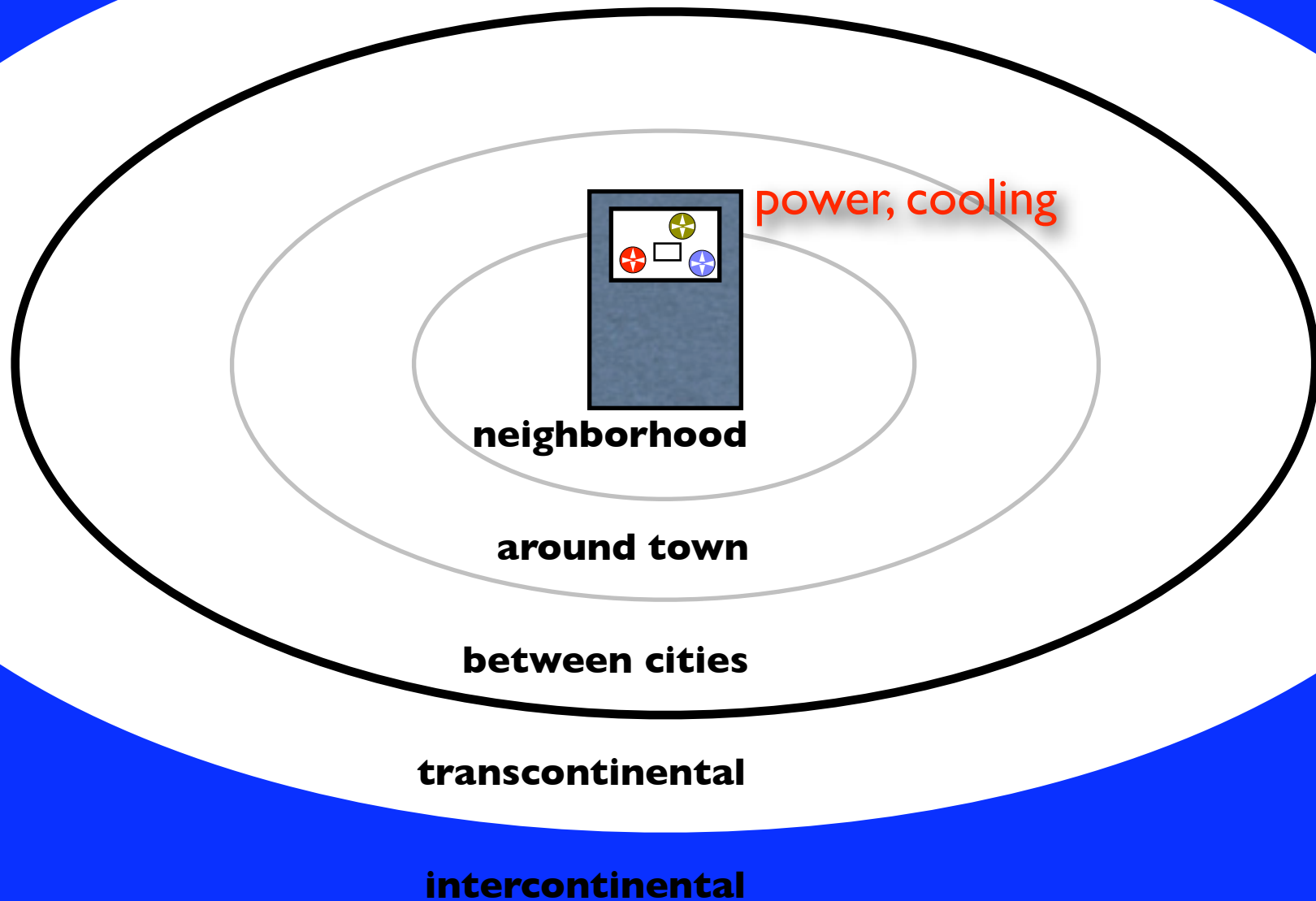
Direction of interconnection by count and/or share, ent. or nat'l;

Concentration levels (HHI) production or interconnection

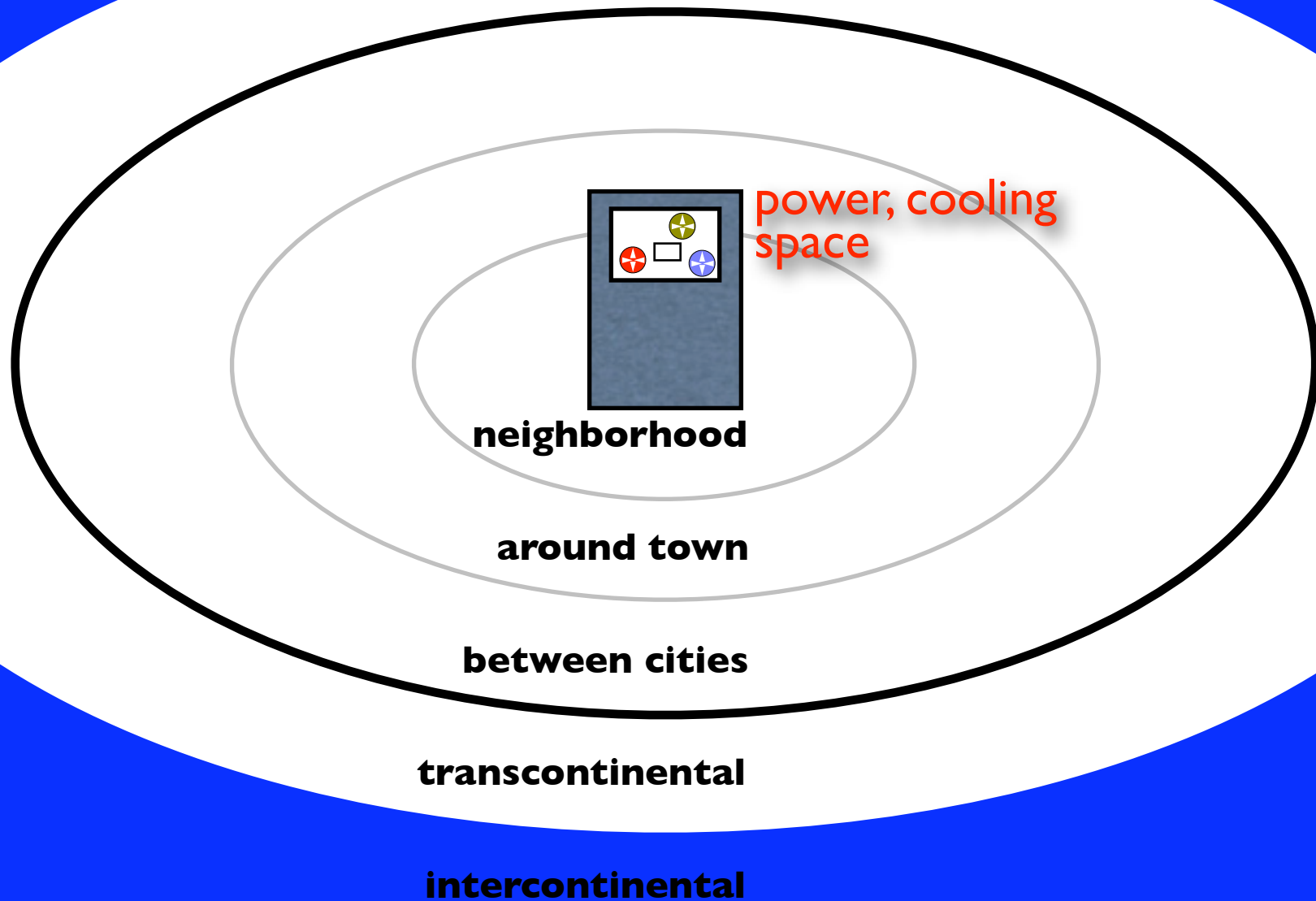
# IXPs: the real world



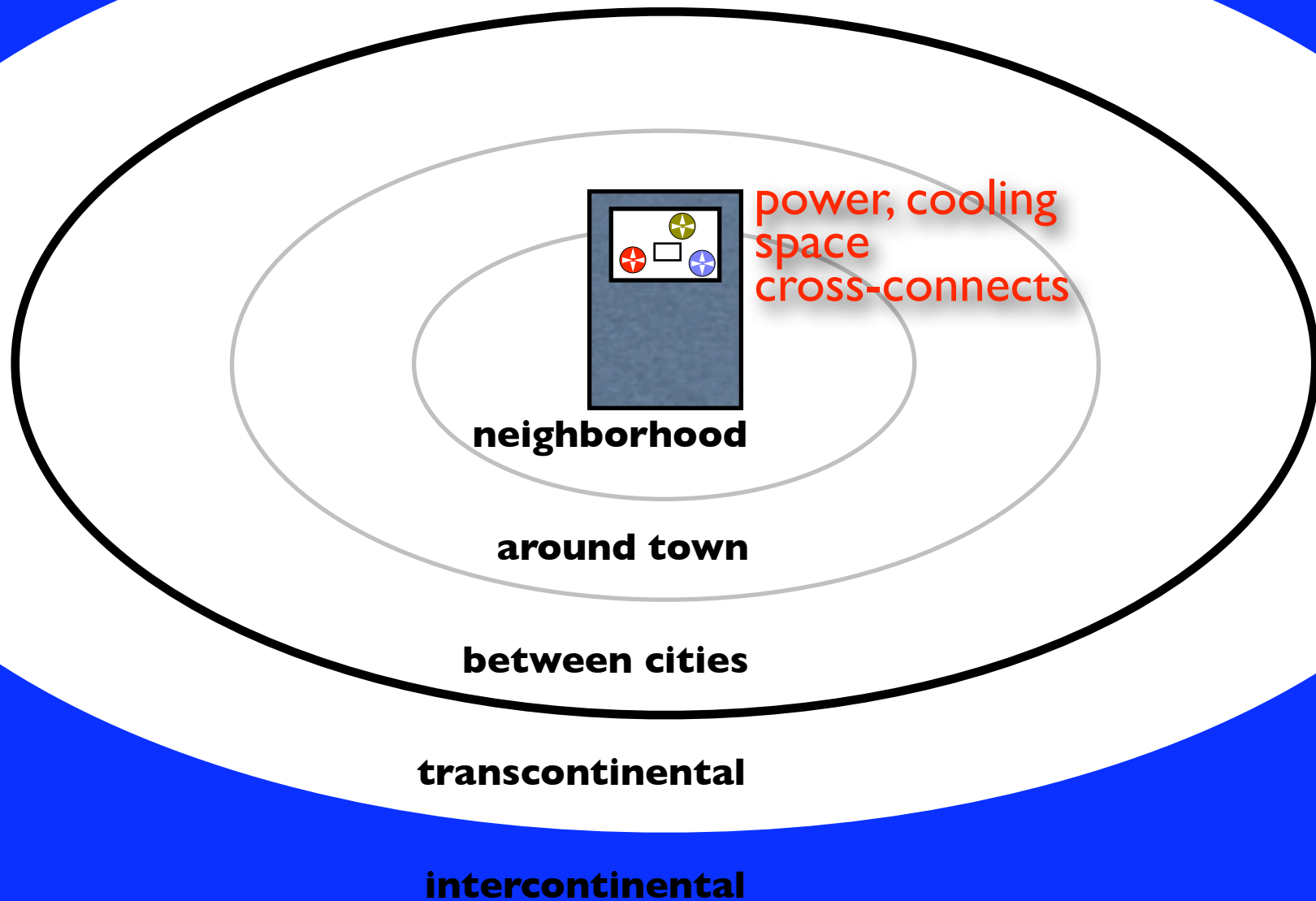
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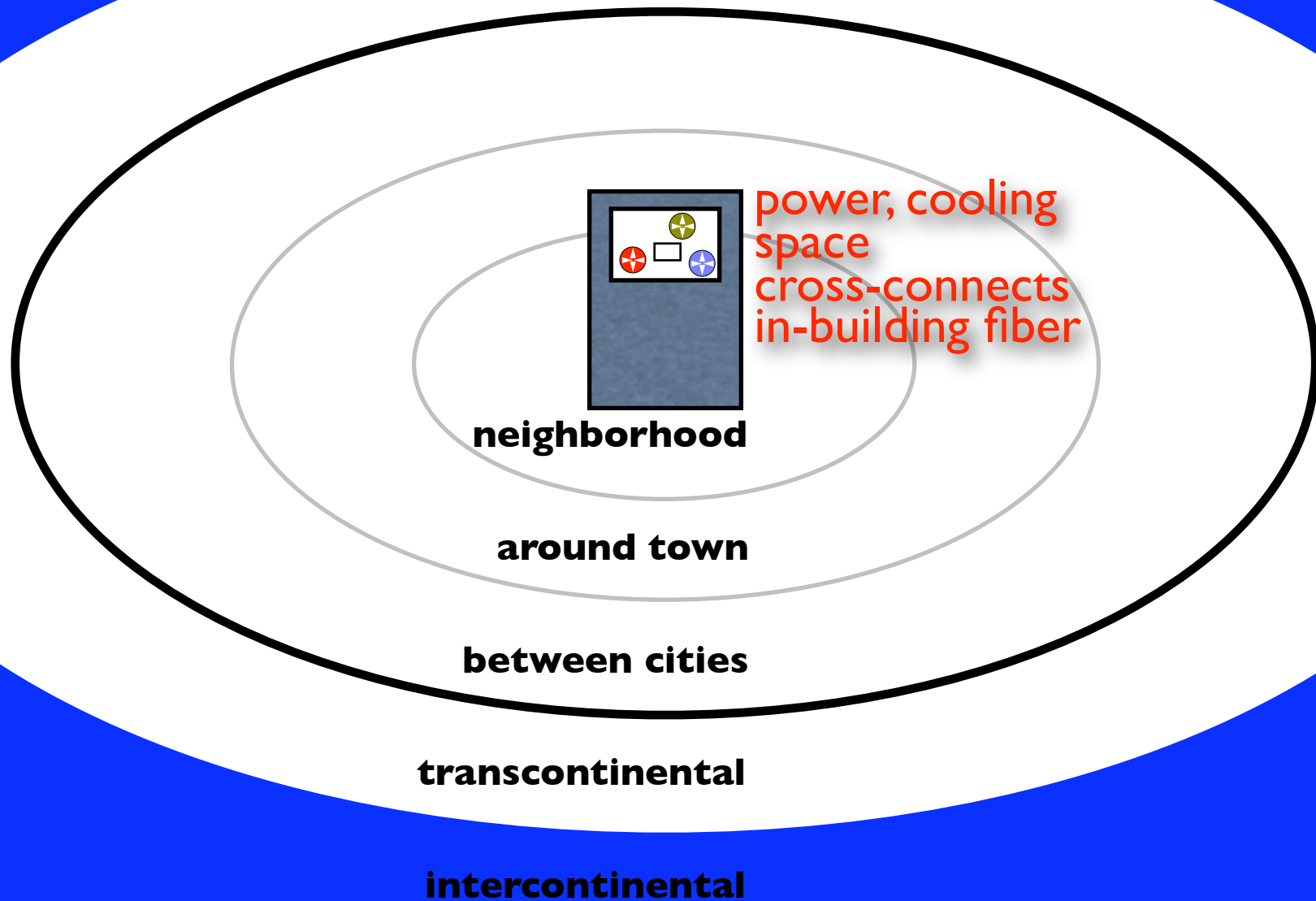


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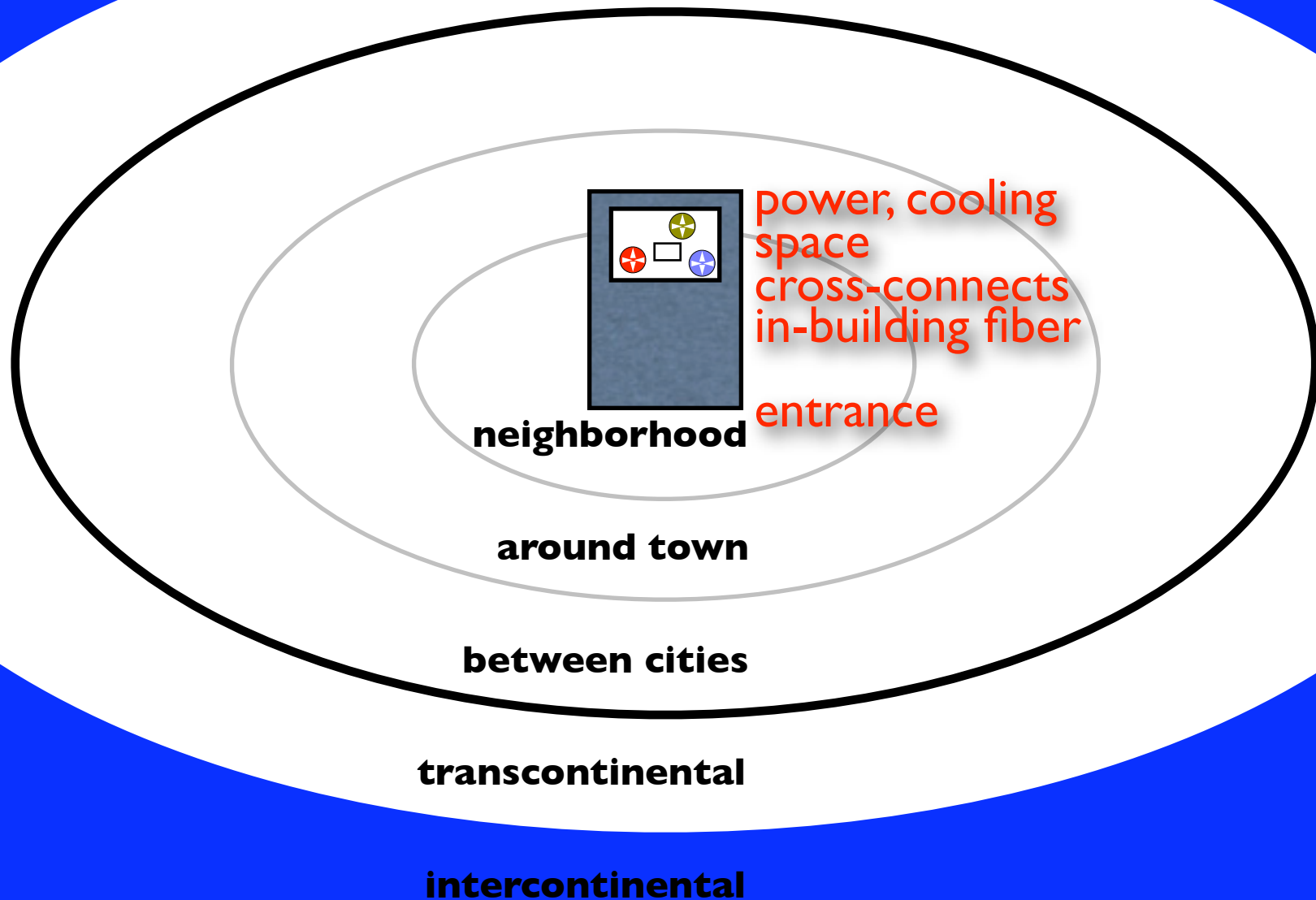




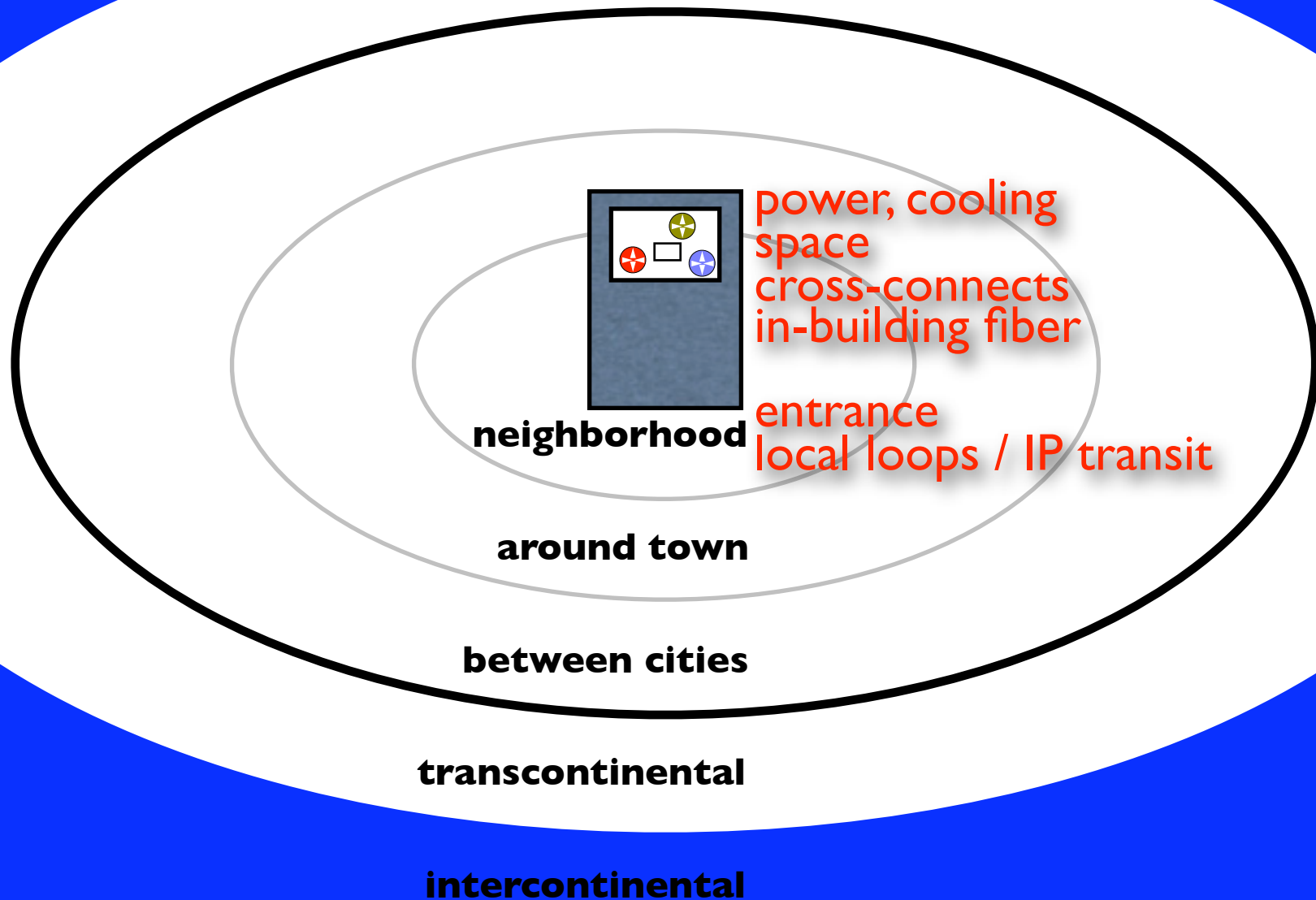
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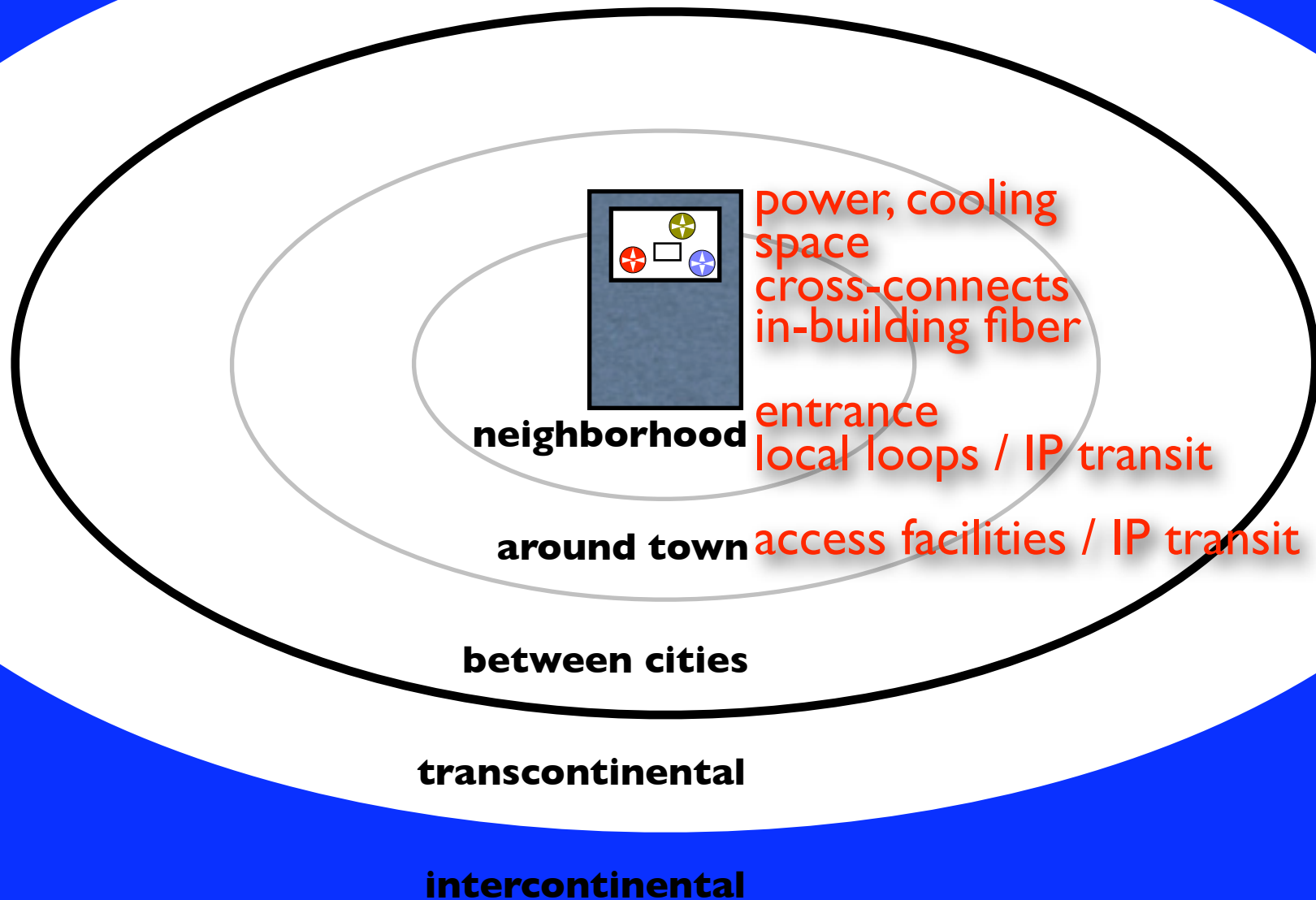
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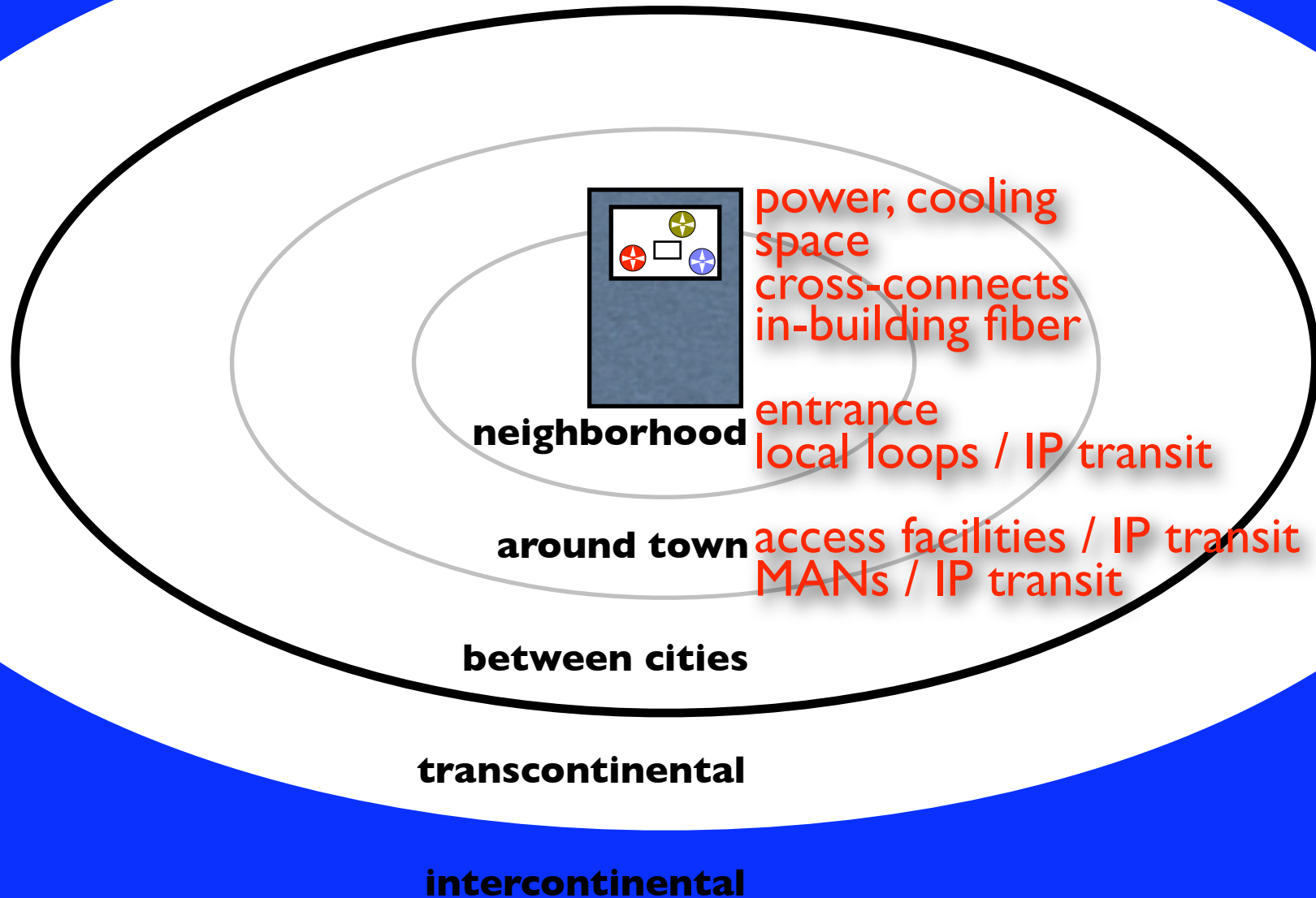
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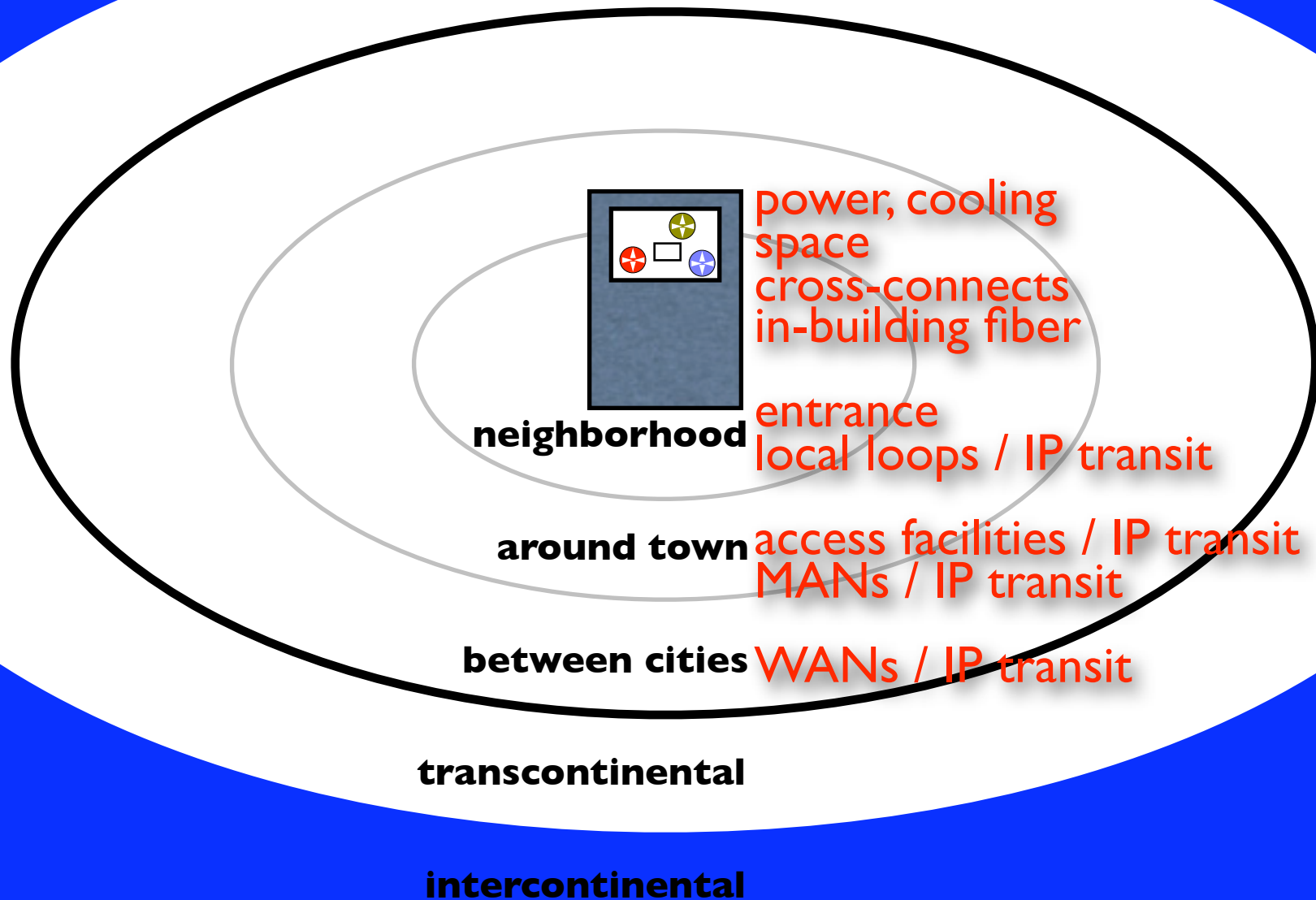
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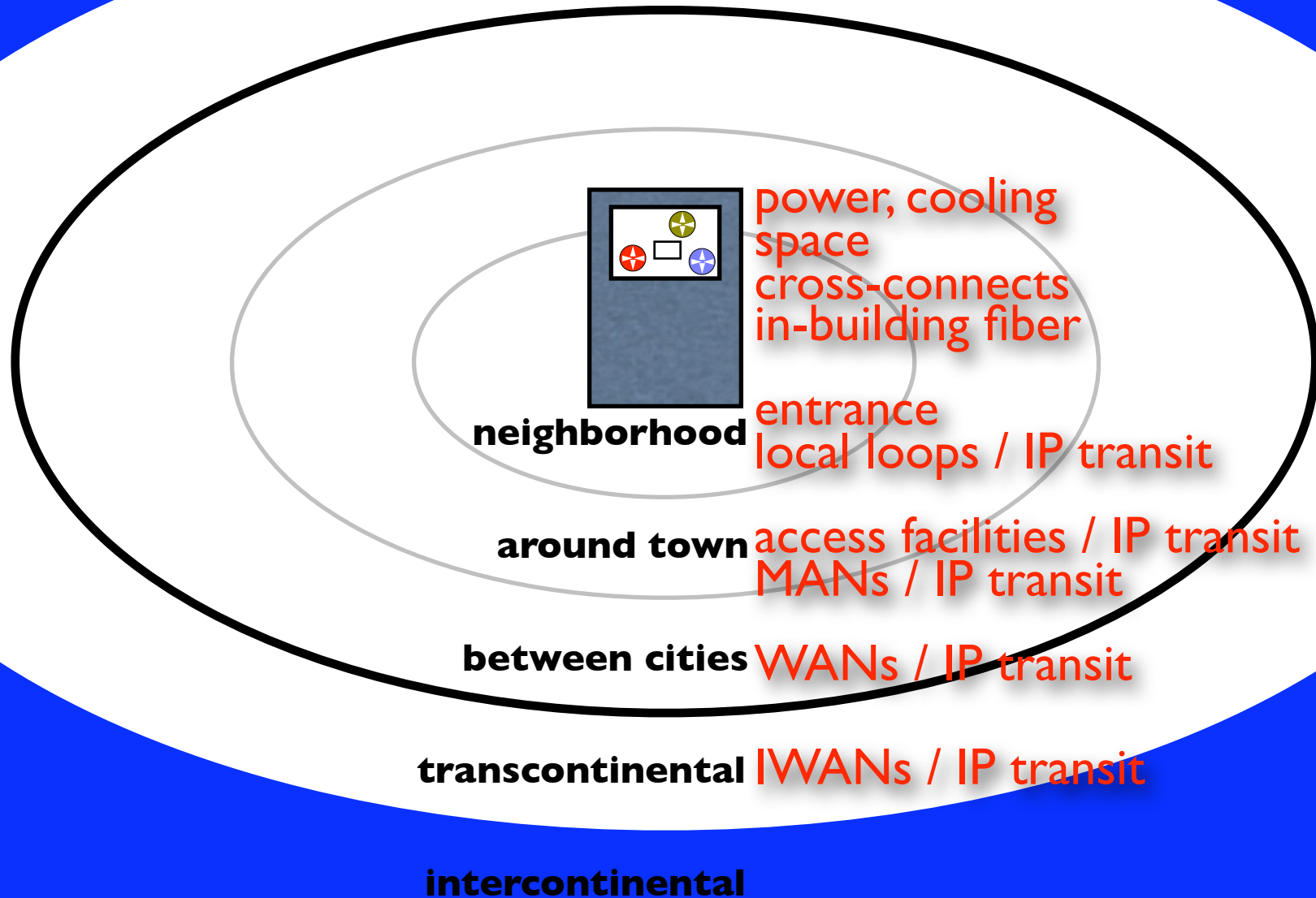
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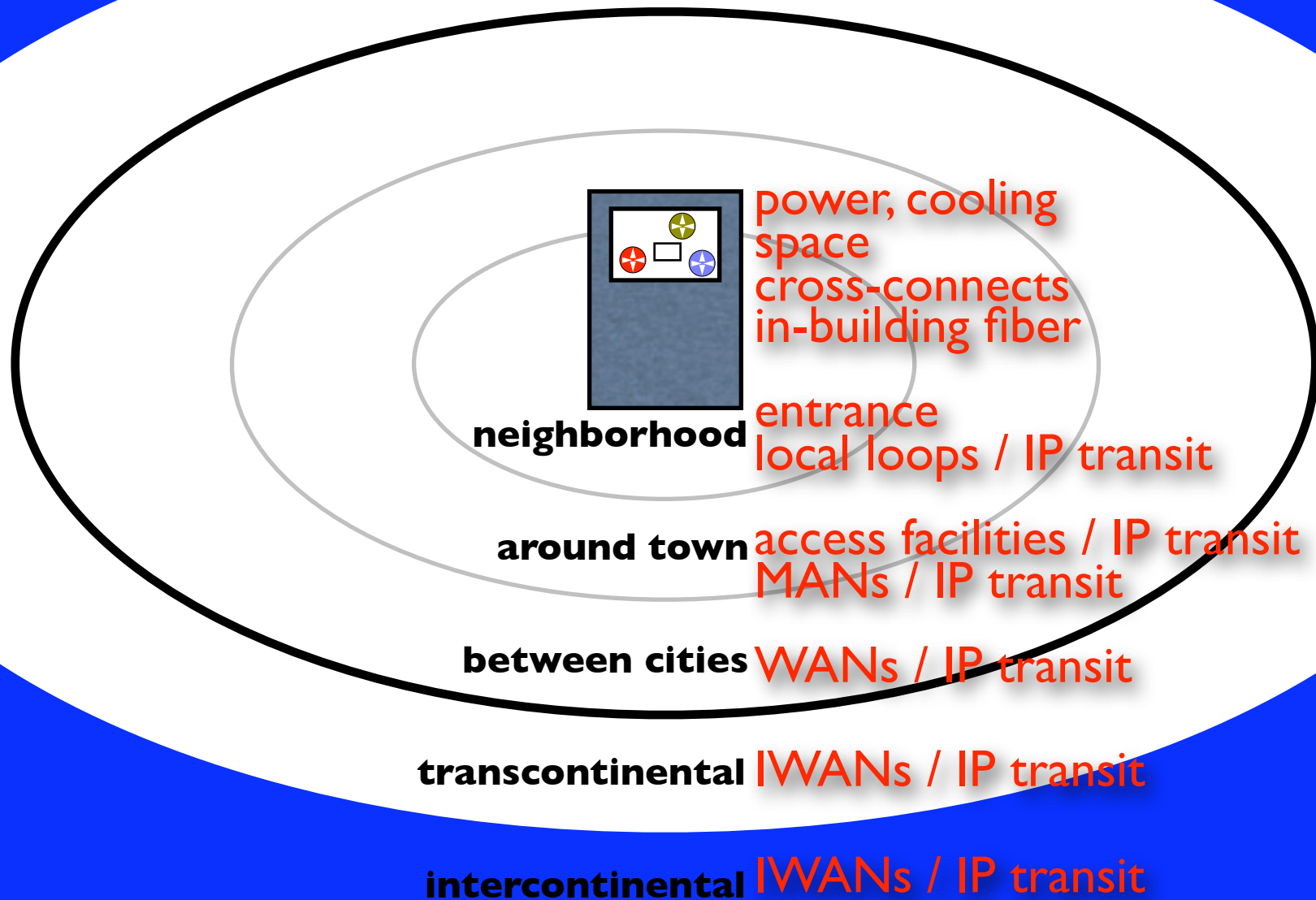
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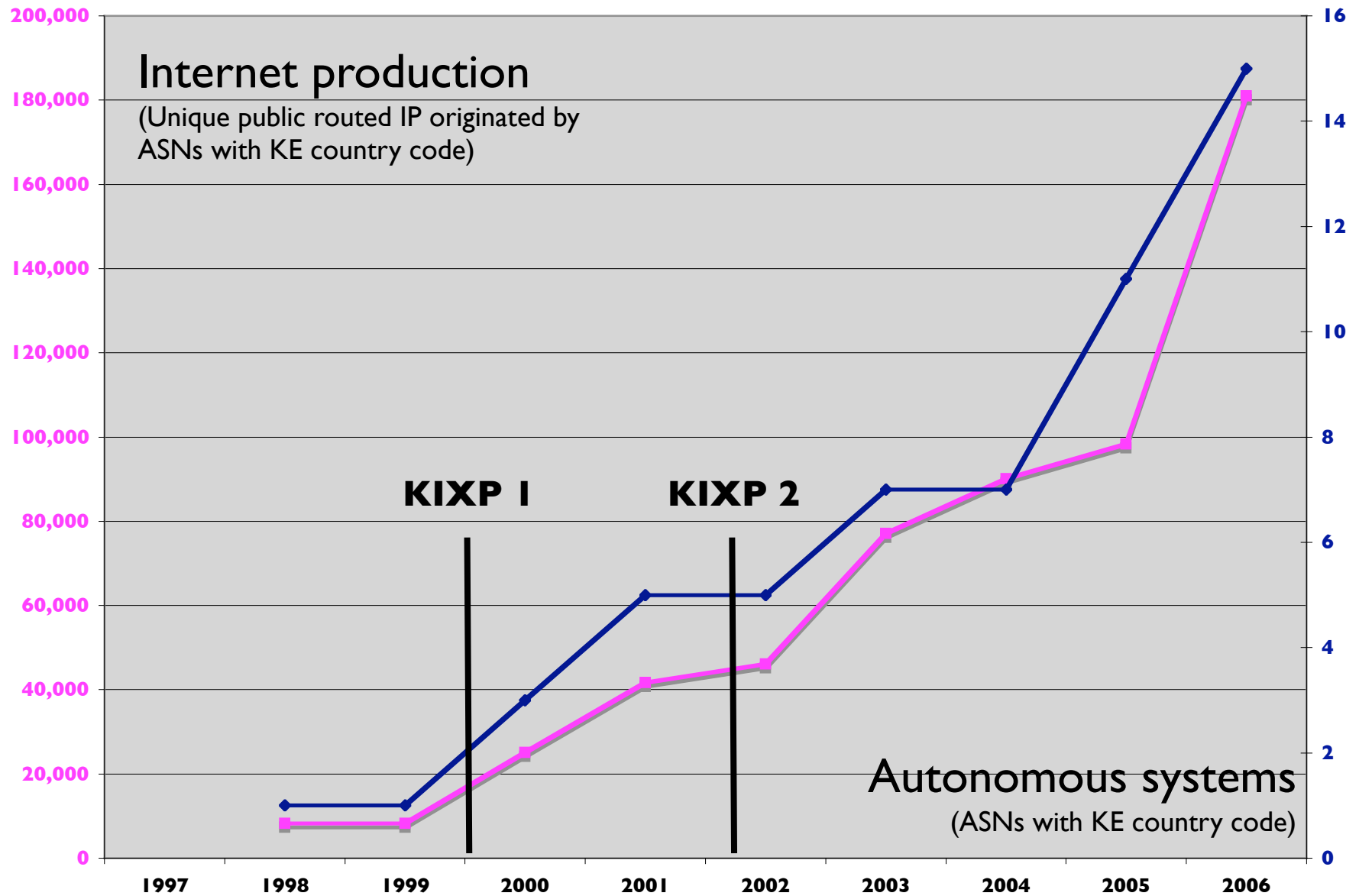


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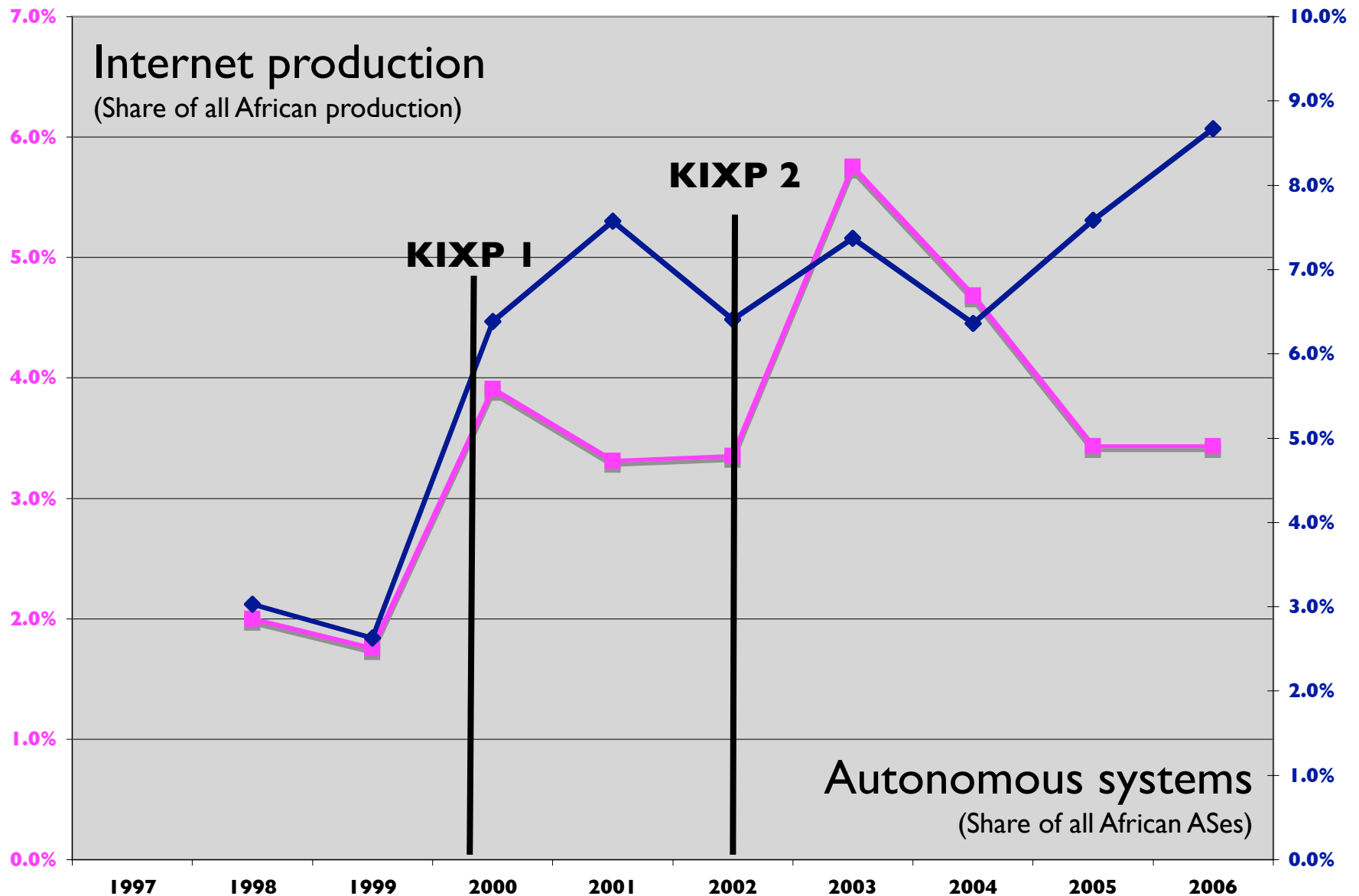




# Kenya (KIXP)



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