

Network Industries and Innovation

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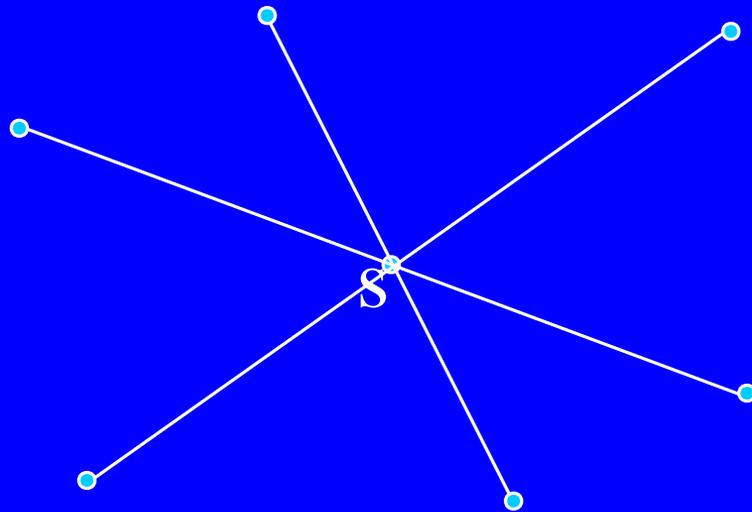
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Networks: A Definition

- Nodes connected by links
- What does this mean?

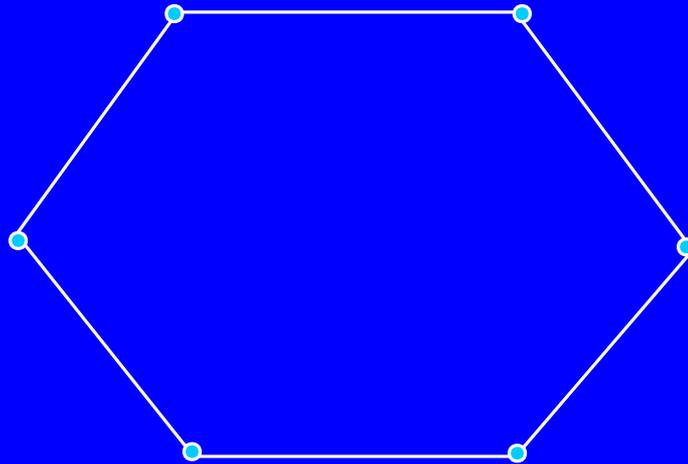
Some Stylized Examples (1)

A simple star network (e.g., local telephone;
local package delivery)



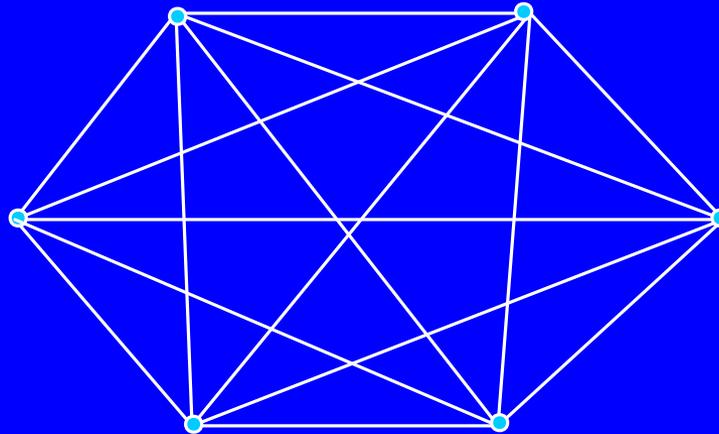
Some Stylized Examples (2)

A simple ring network (e.g., a “beltway”
highway; some computer linkages;
Christmas tree lights)



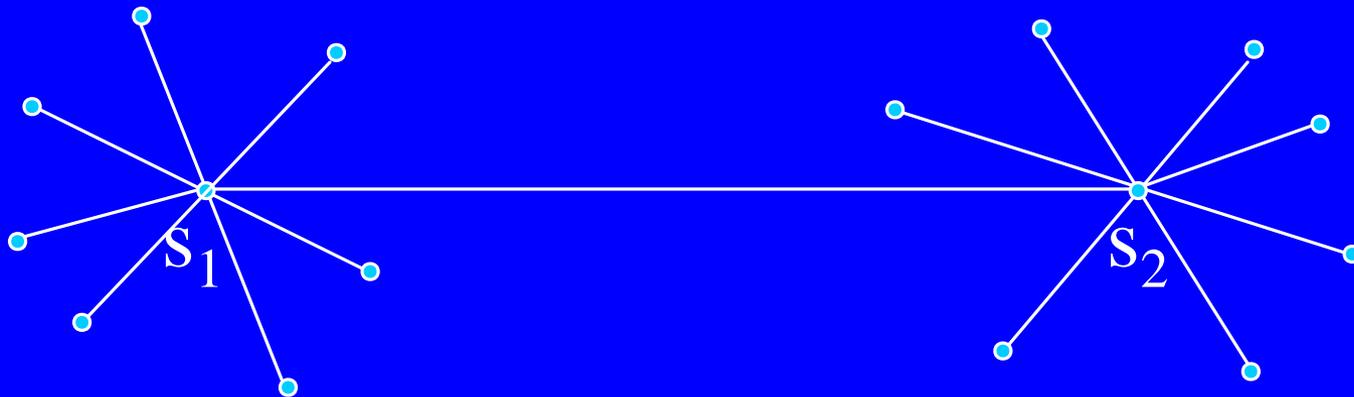
Some Stylized Examples (3)

An all-points connected network (e.g., an urban street system; a “citizens band” radio system)



Some Stylized Examples (4)

Two star networks connected by a trunk line
(e.g., telephone; railroad; airline;
electricity)



Network Industries Are Different

- Network externalities are significant
 - More users raise the value of the network for other users (until congestion decreases value)
 - Directly (two-way): railroads; airlines; telephone; fax; e-mail; etc.
 - Indirectly (one-way): electricity; broadcasting; cable; www; credit cards, etc.
 - Indirectly (“virtual”, one-way): hardware-software; OS-applications software; etc.
- High fixed costs, low marginal costs: economies of scale
- Compatibility; standards are important

Consequences (1)

- “Winner take most” outcomes
 - Competition for dominance
- Path dependence
 - Possibility of “wrong” path
- Potential losses from incompatibilities and from abandoned technologies
- Importance of bottleneck “central facility”
 - Proprietary technology
 - Central “switch”
 - Access

Consequences (2)

- Entry is more difficult
 - Sampling is harder
 - Larger scale entry required
- Innovation?
 - It's complex

Innovation

- Innovation within the existing technological standard can often happen readily -- unless the dominant firm feels threatened
 - Dominant firm may see the innovation as a threat to its core activity
 - Dominant firm may see the innovation as undermining its ability to price-discriminate
- Innovation outside the standard is harder
 - Requires large scale; sampling is difficult

Policy Implications

- Be wary
 - Dominant firms may make life excessively difficult for entrants and innovators
- Be careful
 - Over-reaction may improperly penalize winners and reward losers; over-reaction is anticompetitive
- Bottleneck problems are real
- Standards issues are thorny
 - Sole ownership may create dominance, market power
 - Joint agreements may be unduly exclusionary
- Clarifying an “essential facilities” doctrine (if any) would be useful

Conclusion

- There are no easy answers for antitrust policy
- Good policy requires good judgments and a long-run perspective