Interoperability in the presence of network effects: Antitrust remedy or regulatory rule?

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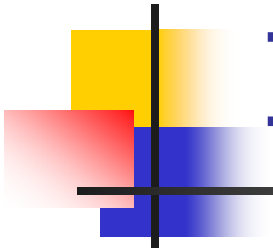
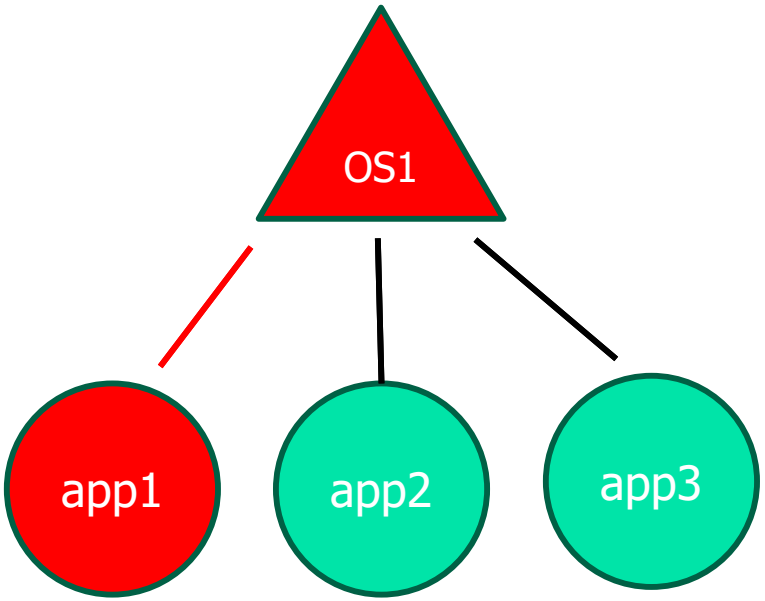


Interoperability

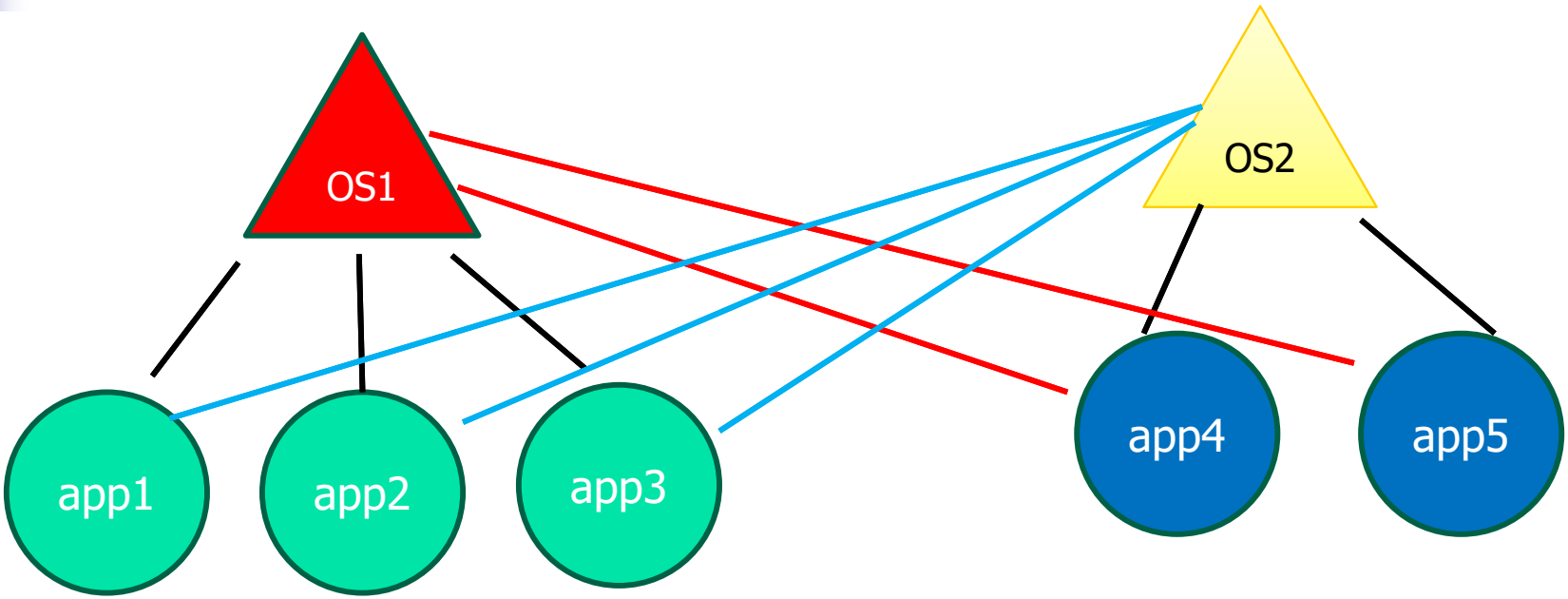
- Interoperability is ability of components (hardware or software) to work together without the need of an adapter
- Horizontal interoperability: ability of products and services at the *same level* of the digital value chain to work together
- Vertical interoperability allows services that are at *different levels* of the digital value chain to work together

OSs and apps: Vertical interoperability or not



- Say app1 be owned by OS1 (e.g. both by Apple)
- **Vertical interoperability** is when the services provided by the black links do not need adapters or extra cost to work
- Important in recent suit US v. Apple; in US v. Microsoft on IE

OSs and apps: Horizontal interoperability or not

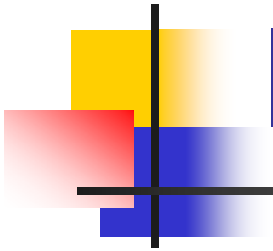


- Starting with non-interoperable systems
- Add **partial horizontal interoperability** of OS1 with app4, app5, red lines
- Add **partial horizontal interoperability** of OS2 with app1, 2, 3, blue lines

Industries with default interoperability across firms

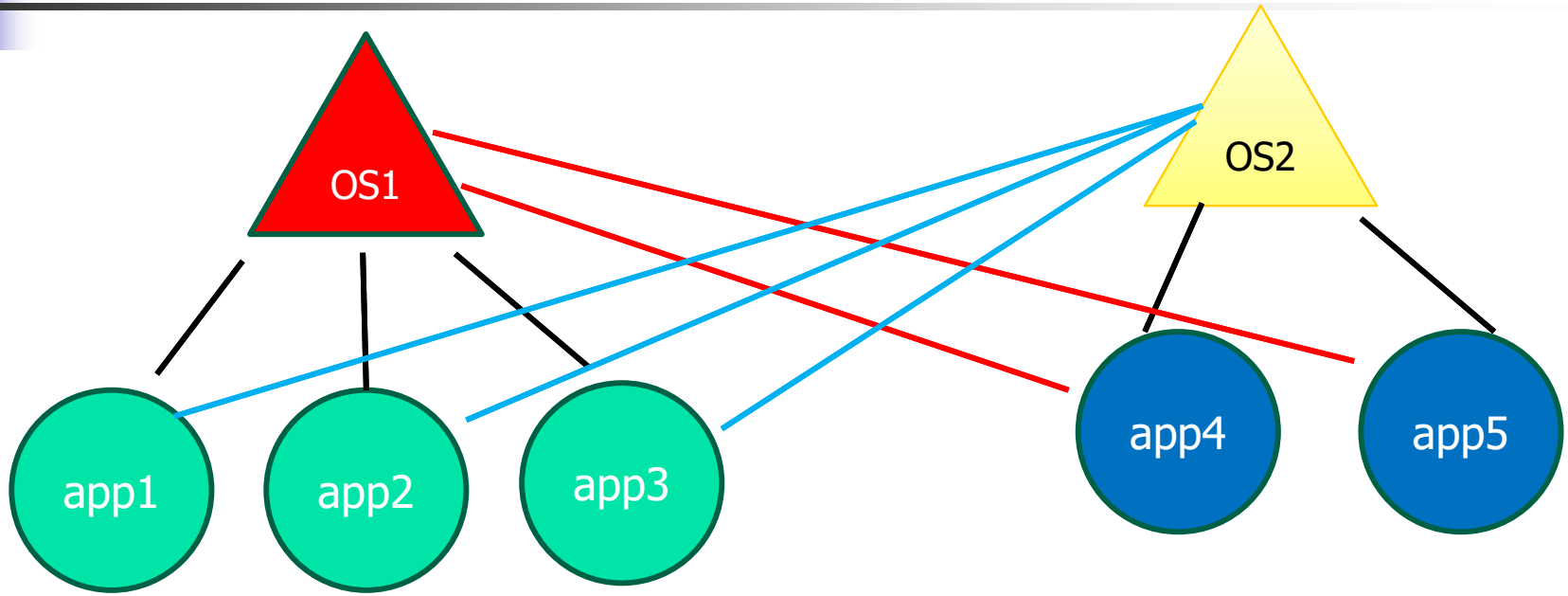
- By protocol design
  - Fax machines (fax started after telegraph, before telephone)
  - Internet-based communications; email
- By regulation
  - Voice telecommunications after imposition of mandatory interconnection of public phone networks by 1934 regulation

Most often, industries exhibit lack of hor. interoperability



- VHS v. Sony Beta
- OSs for PC (Windows, Mac, Linux, …)
- OSs for phones (Android, iPhone, …)
- Various audio files formats
- eBooks formats Kindle and Nook
- Various IMs
- Voice assistants: Alexa, Google's Google Assistant, Apple's Siri, …
- …

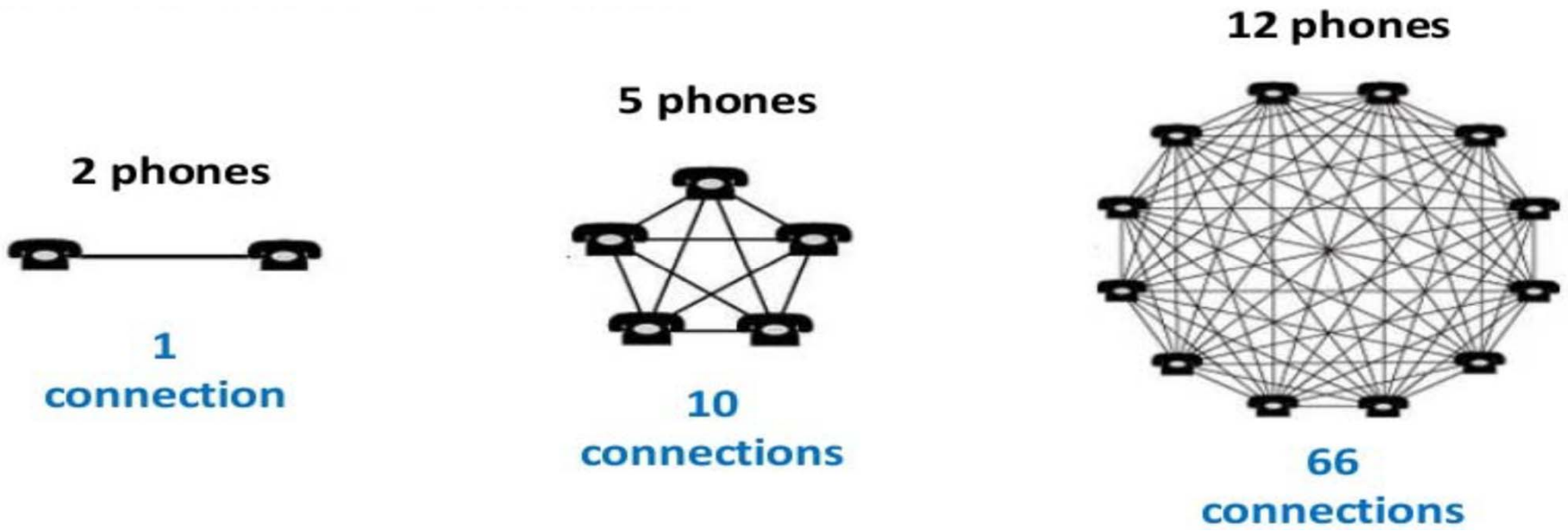
Hor. interoperability requires consensus or regulation



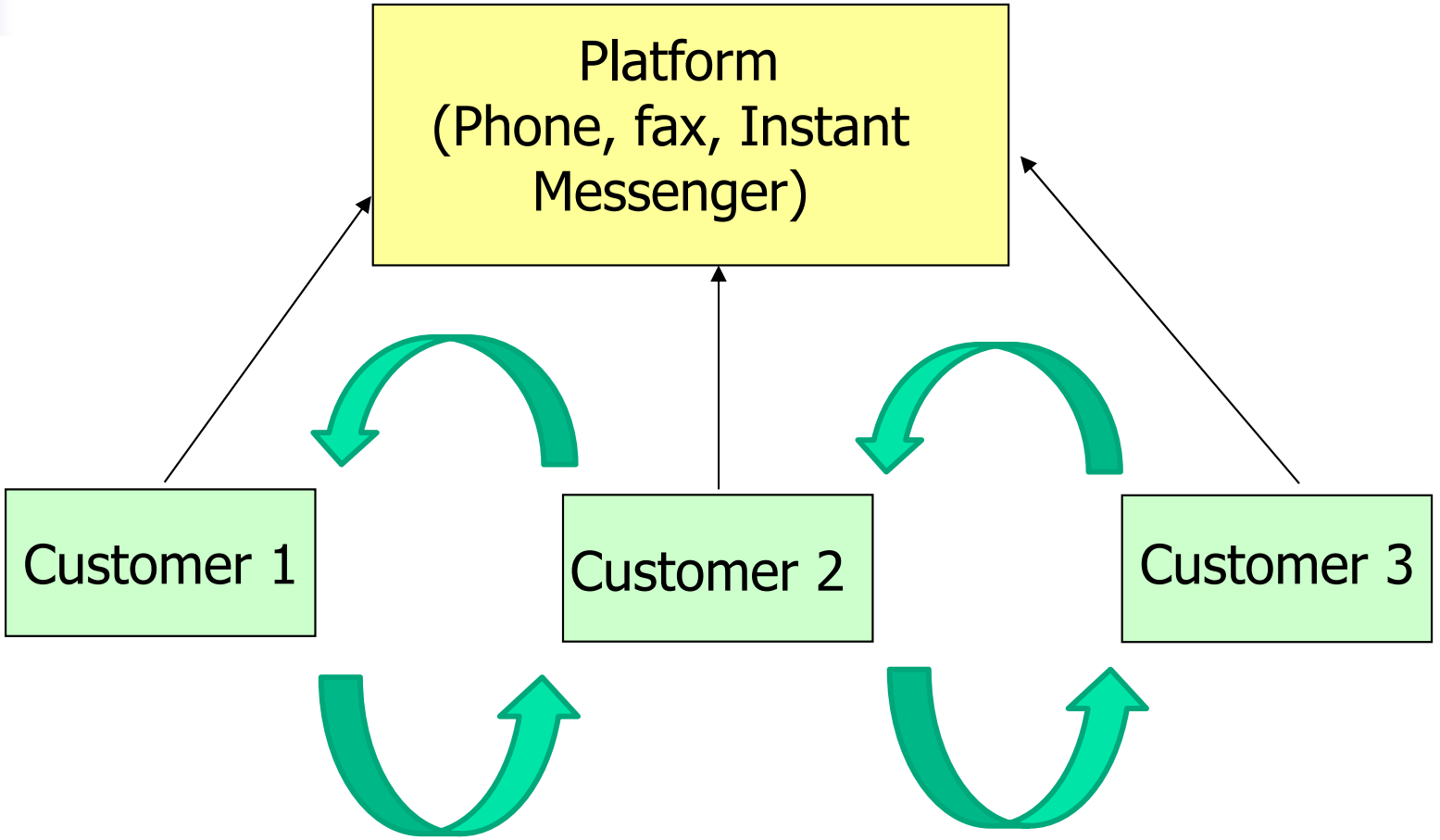
- Red company can disable blue lines; yellow company can disable red lines
- [In the presence of **network effects**, large platforms have incentives to be incompatible with rivals; reverse for small platforms]

Review of network effects

- Platforms leverage network effects
- Network effect: a user values more to connect to a larger network/platform
- Examples: phones, IM, fax, Facebook

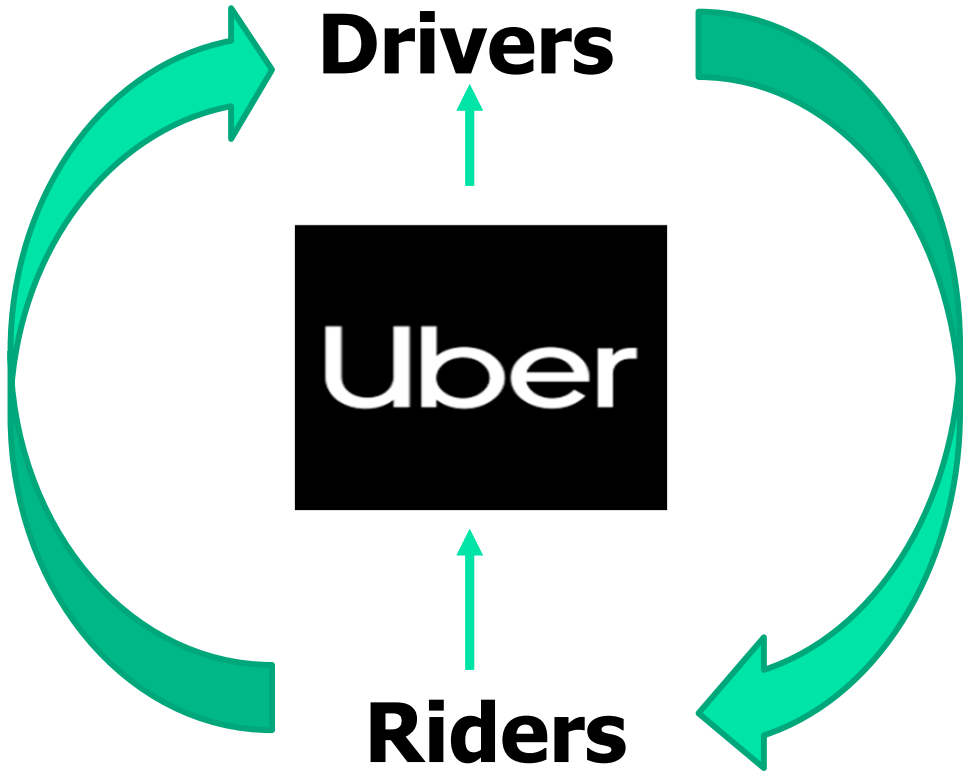


Same-side (direct) network effects: a customer benefits from other customers connecting *on the same side* of the platform



- All else equal, I benefit most from the platform where the people or entities I want to connect with are

Cross-side (indirect) network effects: a customer benefits from more participation *on the other side* of the platform



- More drivers result in quicker pickups by riders
- More riders imply more business for drivers

High market share platforms prefer to be incompatible with rivals; in contrast, low market share platforms prefer interoperability

- Why? If a dominant firm opted for interoperability, it would lose exclusivity of the large network effects it enjoys
- Conversely, small market share firms prefer interoperability
- Why?
  - Because under interoperability small firms can enjoy much higher network effects than otherwise
  - Interoperability can intensify competition which may affect dominant firms more adversely

Companies can use lack of interoperability to marginalize or acquire rivals

- AT&T started with 100% market share because of its patent, until about 1900
- Post-patent-expiration entry resulted in AT&T having only 50% of phone lines in 1914
  - But AT&T had active long distance patents
- AT&T **refused to interconnect** rivals to its long distance network, unless **it acquired them**
- By 1934, AT&T increased its market share to 89%!
- In 1934, regulation imposed **mandatory interconnection** of phone networks
  - In 1981, when AT&T accepted to be broken on antitrust grounds, AT&T's market share was the same 89%

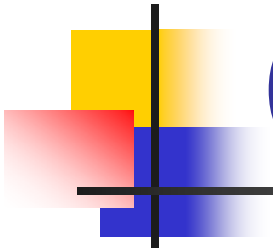
Platforms have high profits because of market dominance

- Often platforms have a dominant position in the market they participate in, resulting in monopoly power and high profitability
  - Why?

Incompatibility + network effects + switching costs + anticompetitive actions can establish market dominance

- Network effect + incompatibility + switching costs + anticompetitive actions + barriers to entry = **winner-takes-most** equilibrium = very significant sales, prices, and profits **inequality**
- **Winner-takes-most** ≠ 100% monopoly, but could be found to illegally "monopolize" a market in antitrust (as for example, Microsoft in PC OS and Google in Internet search were)
- At **winner-takes-most**, there is a large dominant firm and small rivals

If products are incompatible (e.g., Windows, Mac OS)



- With cross-side (for example) network effects, tendency for **very significant inequality** in market shares, prices, and profits
- Why?
- High sales (say of Windows) imply more complementary goods (apps), so the Windows is more valuable
  - Self-reinforcing, leading to even higher sales

Platforms have **significant tools** that help them acquire and maintain **market power**

(1) **Incompatibility** and **high switching costs** toward rivals, including the creation of a walled garden ecosystem

- Company benefits from network effects of users
- Incompatibility prevents rivals from benefitting from network effects, often marginalizing rivals
- Incompatibility locks-in customers
- Incompatibility + network effects result in high barriers to entry

Platforms have **significant tools** that help them acquire and maintain **market power**

(2) **Deception**

- Plans for the future
  - Vaporware
  - Misrepresentations to standards organizations
  - Future prices
  - Rambus critical technology licensing
- Presenting an "innocent" face and "transparency" when collecting data while using the collected data to restrict competition and disadvantage the users

Platforms have **significant tools** that help them acquire and maintain market power (cont.)

(3) **Dominant platform has control and veto power over apps**

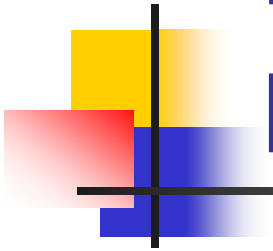
- **Can degrade or kill** apps that compete with its own apps and might lead to a reduction of the fees the platform collects from apps
  - Apple degrades games played on the cloud to promote games played on the iPhone (allegation in US v. Apple)
- **Can degrade or kill apps** or accessories that could reduce the switching costs and loosen the lock-in, such as an app that works on rival platforms too
  - Apple degrades messaging apps, smartwatches, digital wallets that run across OSs (allegation in US v. Apple)
- Both types of anticompetitive actions could be done selectively or platform-wide through the control of APIs

Effects of market power

- **Exercise of market power leads to a reduction of innovation**
  - For example, through the actions in (3)

- Use of all these tools can result in attaining and/or preserving a **monopoly** and **market dominance**

Ecosystem of a platform (e.g., Apple) includes complementary apps and peripherals (to iPhone)



- Complementary apps and peripherals in a platform's ecosystem are compatible with the platform-defining product(s) and incompatible with comparable goods compatible with rival platform(s)
- Existence of collections of complementary goods in a platform ecosystem increases the customers' lock-in and enhances the market power of the platform-defining product

Creation of an ecosystem incompatible with others (e.g., Apple)

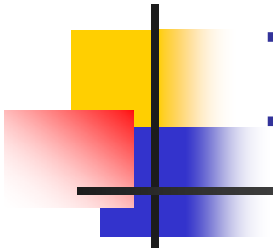
- Increases switching costs to rival platforms and locks-in users in the initiator's platform
- Enhances the market power of the initiator's platform
- Diminishes the market share of platforms participating in rival incompatible ecosystems

Assume that a platform e.g., Microsoft in PC OSs, Google in Internet search, …

- is dominant and has been found liable of antitrust violation(s), say of monopolization
- Is imposition of **interoperability** as a remedy better than (or complementary to) other remedies such as
  - Behavioral restrictions
  - Structural breakups, spinoffs

Assuming antitrust violation, key question on remedies

- How do you
  - **diminish/eliminate the importance of network effects as a strategic asset** used as a lever for expansion of the dominant platform
  - **without reducing the value of network effects to users**?
- Answer: impose interoperability
  - **Achieves both tasks above**
  - Can **help intensify inter-platform competition** by making the single-platform network effects available to rivals
  - Does **not diminish network effects** and value to users that a structural breakup without interoperability would
  - It further adds new network effects to users
  - Users will have wider choices under interoperability



Interoperability advantages

- Diminishes/eliminates the strategic advantage of network effects possessed by the dominant network
- Interoperability allows rival networks to receive and benefit from the network effects of the dominant network
- Network effects are not destroyed
- Additional network effects created

Interoperability disadvantages

- Does it take away the intellectual property of the dominant network?
  - Might force company to make available IP such as patents, copyrights, trademarks
- Diminish innovation? No
  - Interoperable systems provide a foundation upon which new innovations can be built
  - Interoperability encourages a collaborative environment that can lead to novel ideas and solutions that might not have emerged in isolated systems/silos
- Interoperability may be difficult to implement because of lack of technical standards on which to base it
- Given the importance of privacy to consumers, including control of their personal data, sufficient permissions by all parties involved need to be obtained to allow availability of that data to third parties

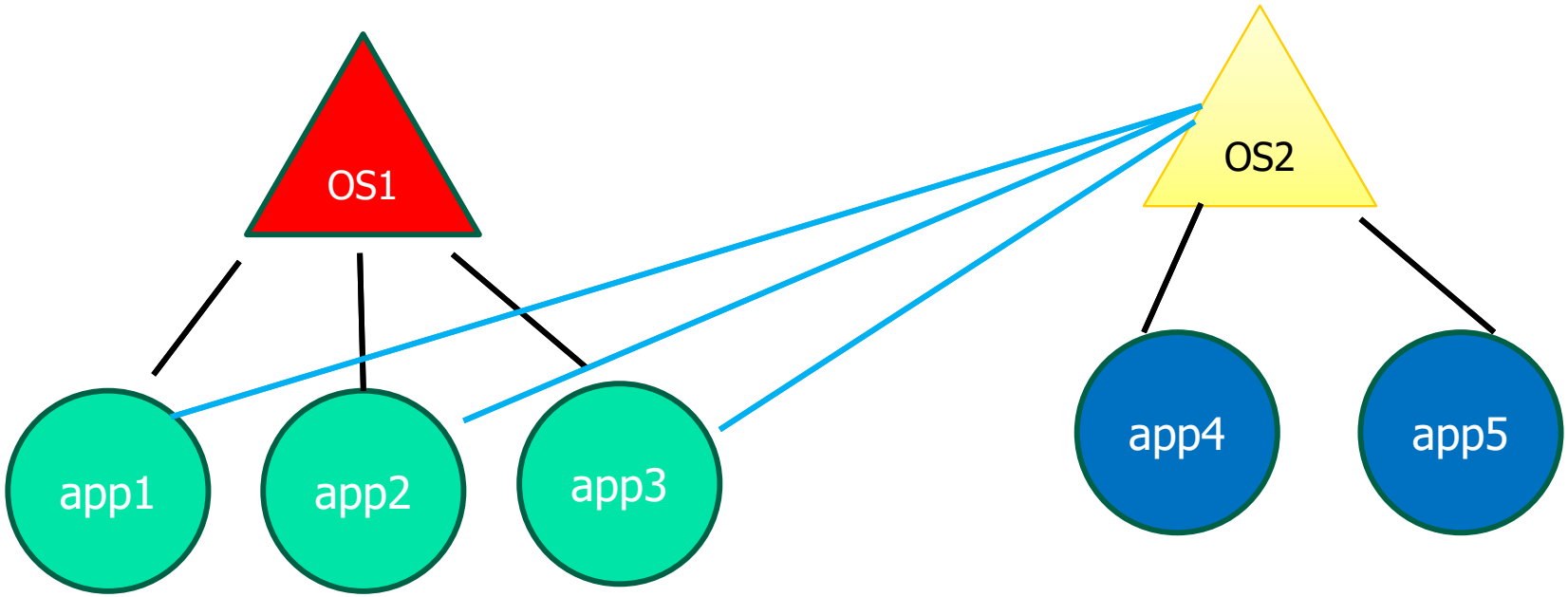
Interoperability implementation issues

- Does it need a sector-specific regulatory agency?
  - Danger of sector-specific regulatory agency be "captured" as it happened with the FCC that was captured by AT&T for decades
- Court may need technical experts to facilitate setting up interoperability
  - Monitoring trustee (Microsoft EU), technical committee (Microsoft US)
- Competition Authority/FTC has the possibility of appointing a technical committee to oversee the application of the remedy (e.g., Scott Morton, 2021)

Interoperability as a remedy in platform monopolization

- In cases of **indirect network effects**
- **Remove switching costs**
  - Change APIs so that they do not create switching costs and lock in
- APIs defined by the ecosystem initiator will now allow interoperability with rival platforms and ecosystems
- Such APIs will also allow interoperability of apps with rival ecosystems (for example Apple ecosystem apps with Android ecosystem apps)
- Impose restrictions on dominant firms on apps control by a platform (e.g., Apple)

Court-imposed partial hor. interoperability of dominant firm with cross-side network effects



- OS1 (dominant) is forced to allow access of OS2 to formerly OS1-only apps (partial hor. interoperability)
- Note the **asymmetry**: OS1 still does not have access to OS2's apps, i.e., no red lines
- We are **not** at full hor. interoperability

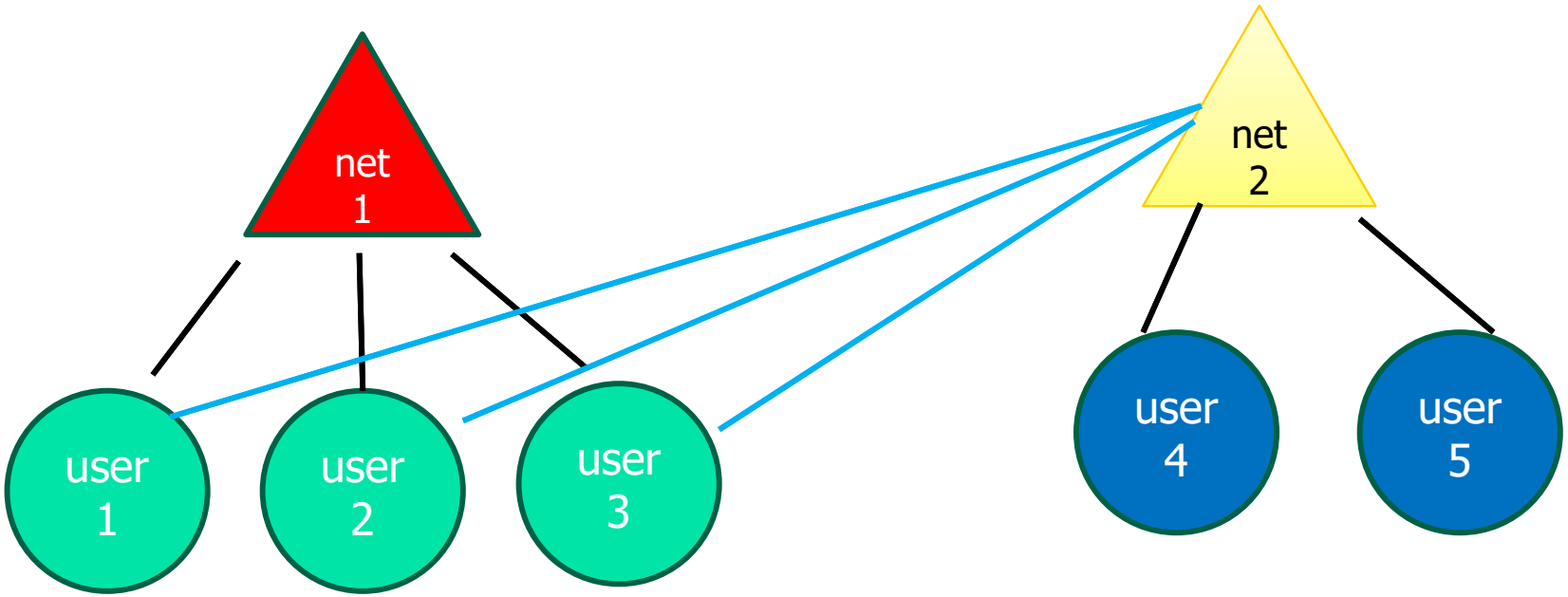
Court-imposed partial interoperability of dominant firm with direct network effects

- In cases of **direct network effects** with a court finding of monopolization, a possible remedy is the imposition of **interoperability across networks**
- This requires **enhanced data portability**

Interoperability and enhanced data portability as a remedy

- **Establish interoperability across ecosystems/platforms**
  - How?
  - Impose **enhanced data portability** of all the network connections of the dominant firm, allowing users to easily and costlessly replicate their network connections within a rival platform
  - This means that a user will be offered not only to switch to a new network/platform herself with all her own data, but also that her connections on the platform are all offered to switch to the rival platform

Hor. interoperability or not with same-side network effects



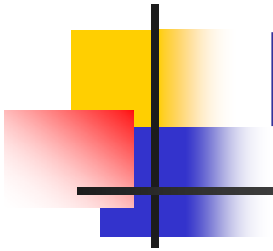
- Starting with incompatible platforms
- Dominant firm (net1) is forced by court to allow users to migrate to net2 together with their network connections
- No symmetric obligation to net2, no red lines

Enhanced data portability

- provides users with the ability to export their social graph or their search history
- Could ensure the free flow of personal data and that users are not captive to a limited number of digital platforms

Appropriate level of partial horizontal interoperability?

- One extreme:
  - Total openness, allow rivals to run algorithms on the dominant firms' database
- Other extreme:
  - Limited portability, allow a user to download only her own data from the dominant firm
- In between:
  - "Medium portability," allow a user to move to rival together with her connections
- Since here hor. interoperability is a remedy for monopolization, degree of interoperability imposed by the court will depend on the extent of liability found



Possible implementation

- Once user A asks for porting out her social graph to a rival platform, it is granted, and all her connections/friends are asked whether they would also be her friends in the rival network
- Dominant platform then gives access to rival to download and replicate the social graph of user A

I have discussed partial interoperability imposed by the court *ex post* as a remedy to an antitrust violation

- Should we go further
  - In requiring interoperability ex ante?
  - In requiring interoperability by all firms, irrespective of market share?
- This would require the creation of a new **regulatory regime** in addition to antitrust enforcement
  - Possibly similar to regulation of telecoms by the Federal Communications Commission, started in 1934

Competition by design?

Antitrust remedies

- Ex post and based on prior finding of liability
- Against the infringer /monopolist only
- Tailored to infringing conduct and specific harm
- Mainly reactive
- Focused on **restoration of competition**

Regulatory remedies

- Ex ante – not based on prior finding of liability
- Imposed on all firms in the market
- Not conduct-specific; targeting broader market failures
- Typically proactive
- Focused on **fostering competition**

Impose partial hor. interoperability on large platforms **irrespective of violations** Example: EU Digital Markets Act (DMA)

- DMA applies only to large firms (capitalization > $75b) in digital markets, called **gatekeepers,** controlling **core platform services**
  - In practice the DMA has been applied to less than a dozen firms, almost all US-based (exceptions ByteDance, Booking.com)
  - DMA imposes partial interoperability
- Imposes other extensive obligations on gatekeepers

Recent DMA cases

Alphabet Inc.

Download the Designation Decision

— Core platform services

Google Play | Case DMA.100002

Google Maps| Case DMA.100011

Google Shopping | Case DMA.100011

Google Search | Case DMA.100004

YouTube | Case DMA.100005

Android Mobile | Case DMA.100009

Alphabet's online advertising service | Case DMA.100010

Google Chrome | Case DMA.100008

Amazon.com Inc.

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Marketplace | Case DMA.100018

Amazon Advertising | Case DMA.100016

Apple Inc.

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AppStore | Case DMA.100013

iOS | Case DMA.100025

Safari | Case DMA.100027

ByteDance Ltd.

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TikTok | Case DMA.100040

Meta Platforms, Inc.

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— Core platform services

Facebook Marketplace | Case DMA.100044

Facebook | Case DMA.100020

Instagram | Case DMA.100020

WhatsApp | Case DMA.100024

Messenger | Case DMA.100024

Meta Ads | Case DMA.100035

Microsoft Corporation

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— Core platform services

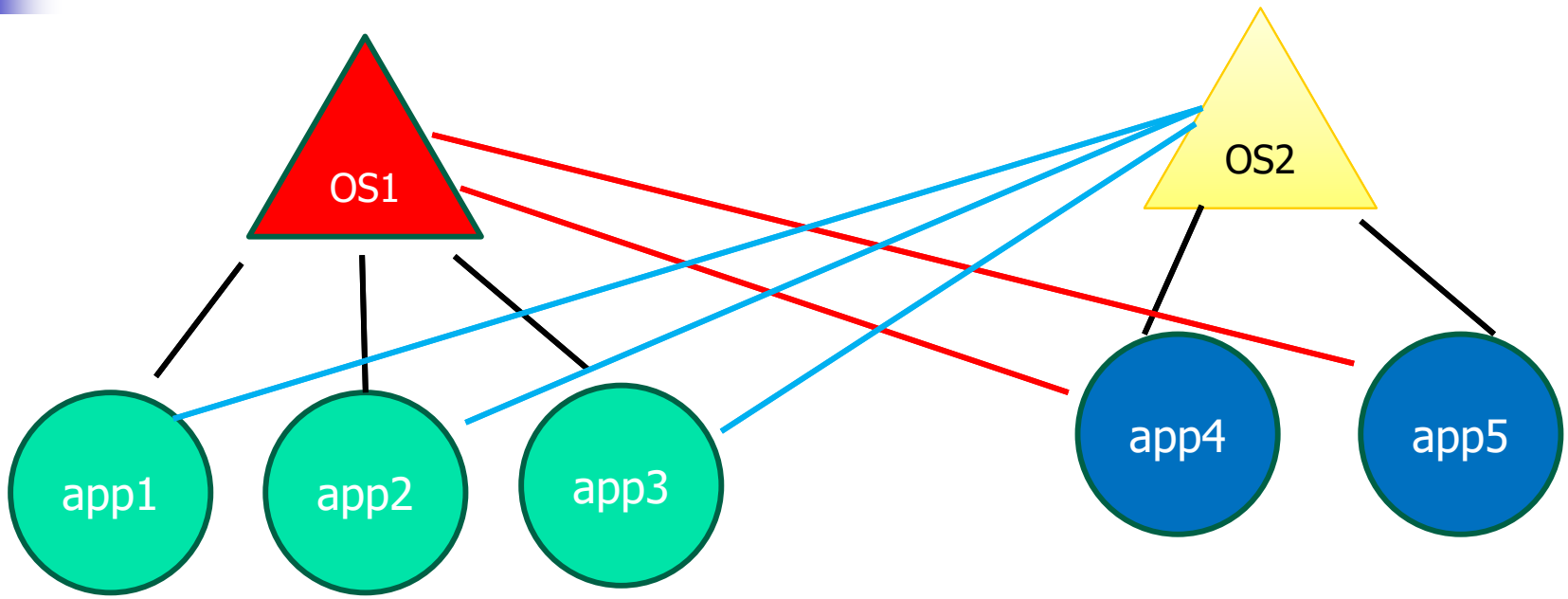
LinkedIn | Case DMA.100017

Windows PC OS | Case DMA.100026

DMA Art. 7: Enabling horizontal interoperability in interpersonal communication services

- Requirement "to make basic functionalities of gatekeeper's number-independent **interpersonal communication services** *compatible free of charge* with similar third-party services by providing necessary technical interfaces or similar solutions"
- Obligation for gatekeepers providing messenger services to allow for interoperability upon request:
  - Text messages between individuals (immediately after entry into force/designation)
  - Group chats (two years after entry into force/designation)
  - Audio and video calls (four years after entry into force/designation)

We could also create a full interoperability regime as in voice telecommunications (1934)



- Starting with non-interoperable systems

Change to full hor. interoperability with both blue and red lines

Concluding remarks

- Interoperability can intensify competition among digital platforms, increase the benefits of network effects for all platforms, and benefit users
- Does not reduce network effects as breakups/spinoffs might
- In contrast, interoperability can enhance network effects in a breakup

Concluding remarks (cont.)

- After a finding of antitrust liability, a court may impose partial interoperability
  - EU's DMA similarly imposes partial interoperability on large companies in communication services
- Could also have full interoperability imposed by regulation as in telephones
- May require a novel institutional design and long-term supervision