Safeguarding the Future of the Internet

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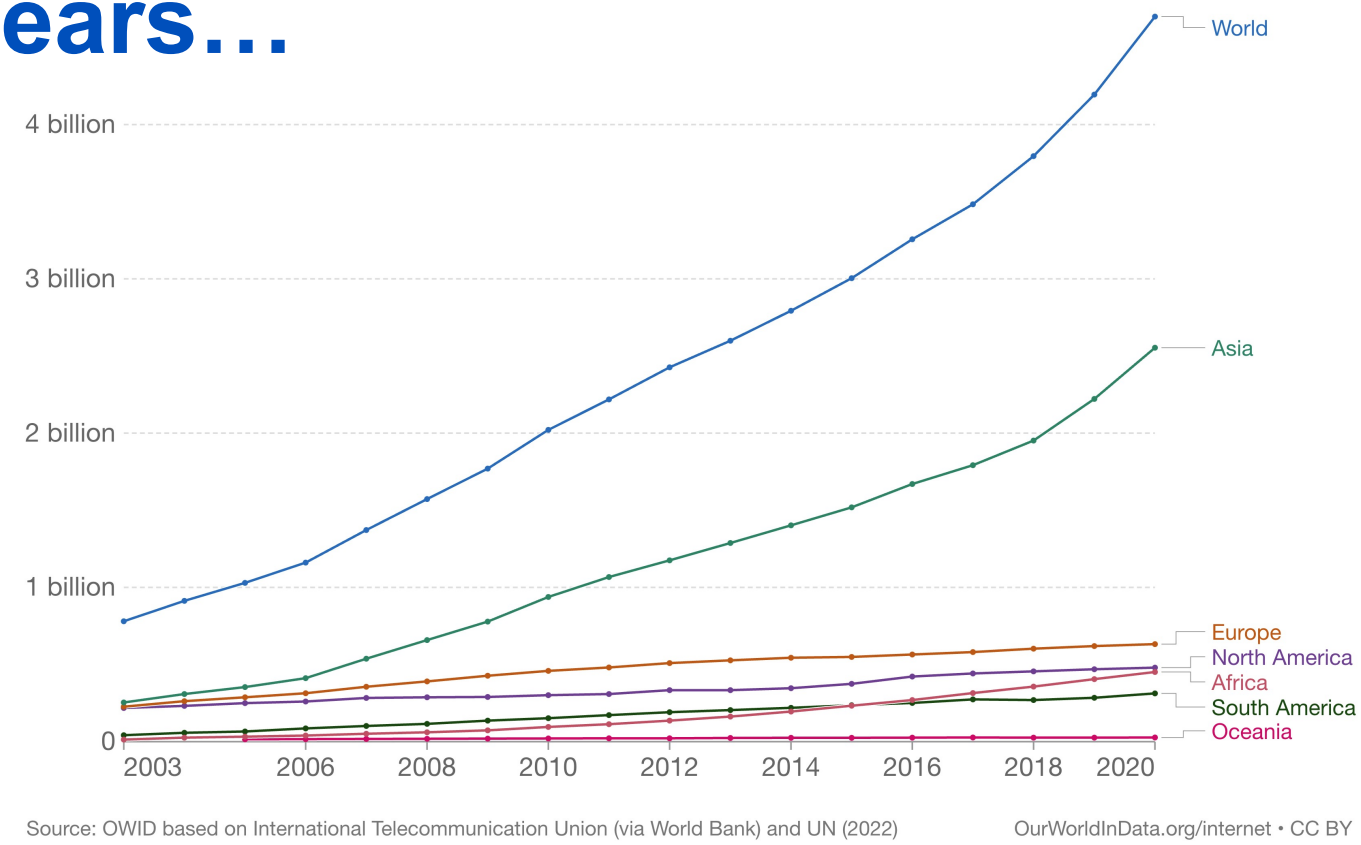
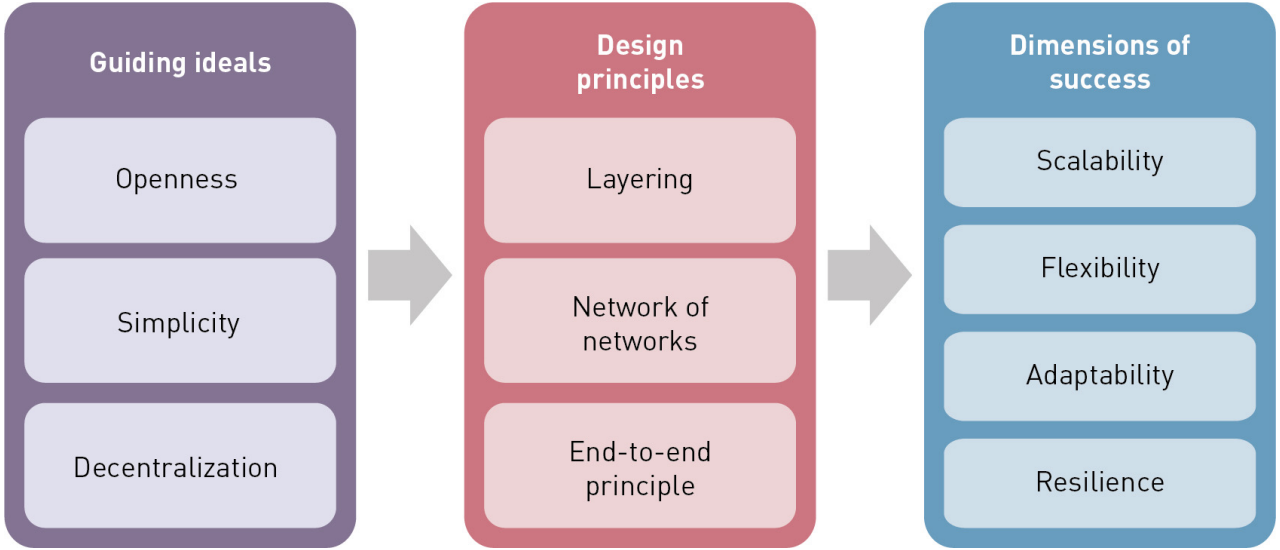
APIGA2023

2023: 5.3 billion

20 years…

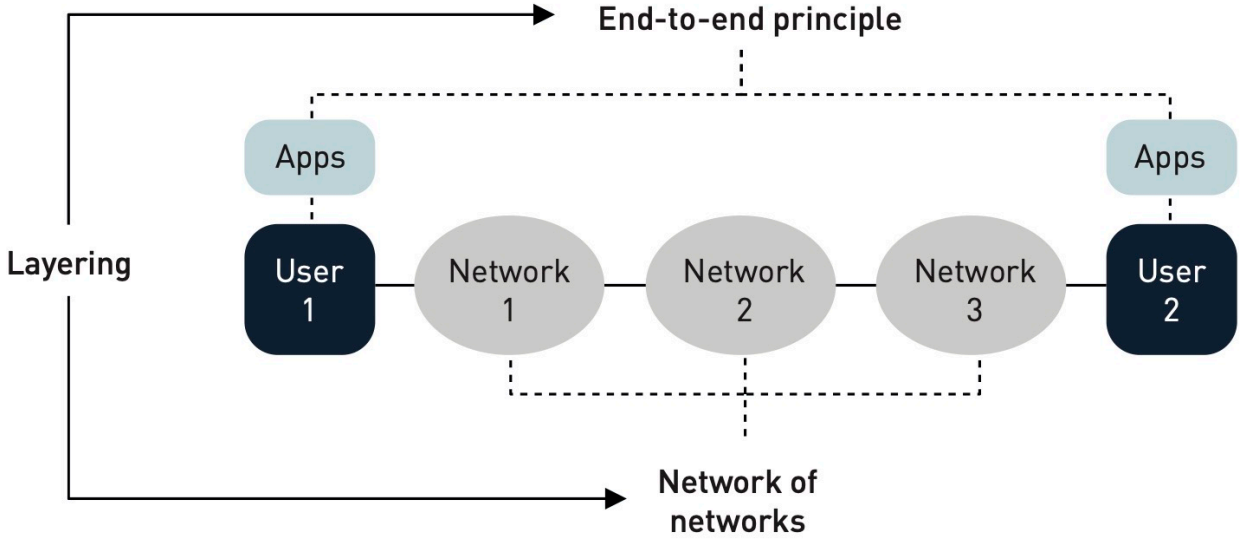


Guiding ideals / Design Principles



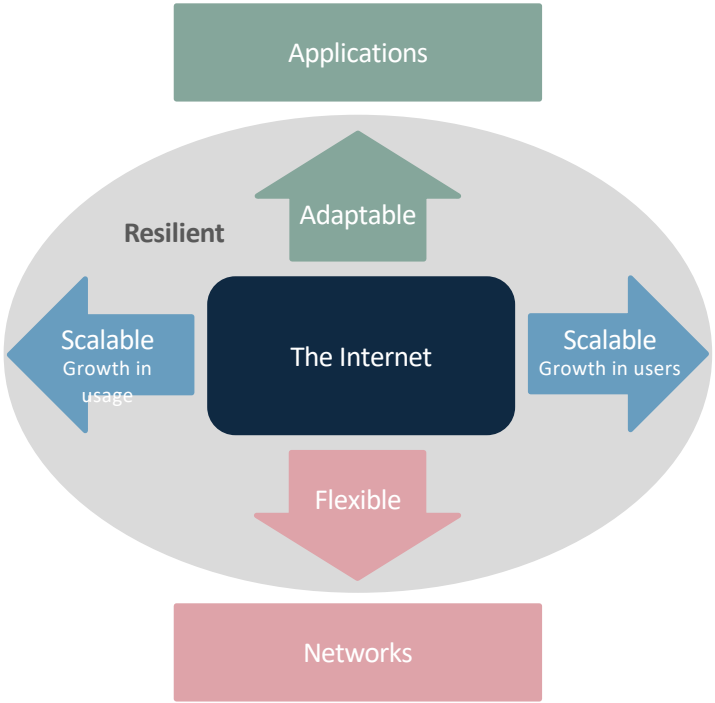
- The early development of the Internet was based on openness, simplicity, and decentralization.
- Three well-known design principles that sprung out of the guiding ideals have been central to the Internet's development and are useful concepts to understand the dimensions of success

Design Principles



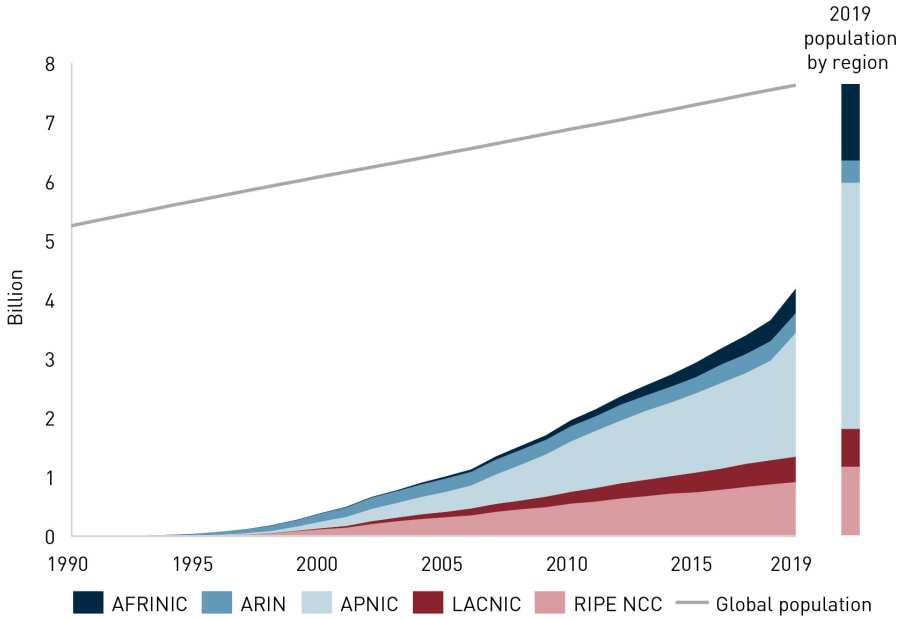
- Three well-known design principles that sprung out of the guiding ideals have been central to the Internet's development and are useful concepts to understand the dimensions of success: layering, network of networks and end-to-end.

Four dimensions of success



- The Internet has successfully scaled to the increased demand from new users and usage,
- It has been flexible to new network technologies,
- It has adapted to new applications,
- And the whole has been resilient to shocks and changes.

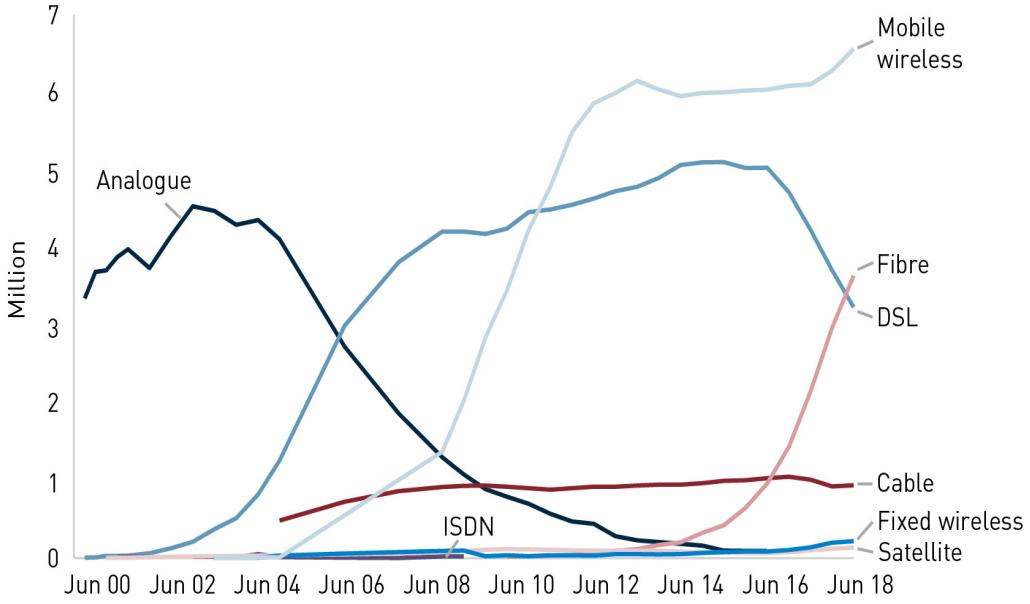
Scalability



Internet users by RIR region, overlaid with global population [Source: ITU, World Bank, 2021]

- The Internet is scalable in its technical architecture, operational and business models, which has enabled it to grow quickly and with few imposed constraints
- The underlying technical design principles, particularly layering and network-of-networks, have enabled growth in the geographic reach of the Internet, while also scaling so that speeds are improving over time. This has allowed introduction of new networks that give increased capacity, while at the same time the routing system has scaled well to the increased number of networks

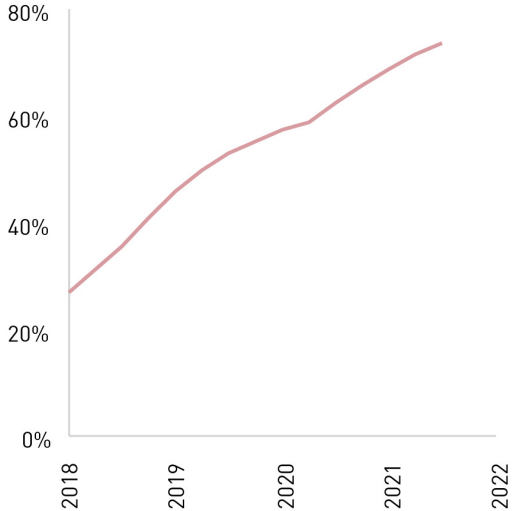
Flexibility



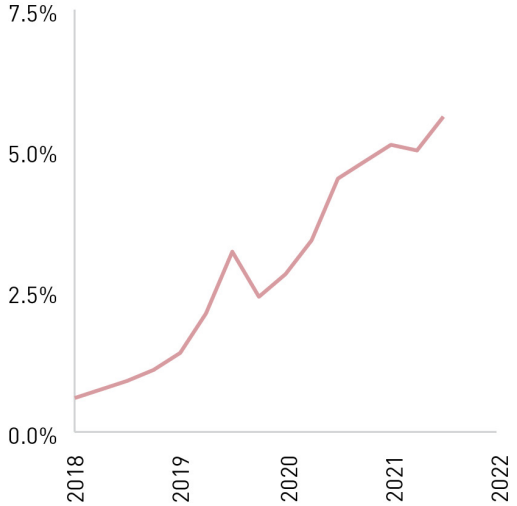
Number of Internet subscriptions by access connections, Australia [Source: Australian Bureau of Statistics, 2021]

- The Internet is flexible to different types of underlying networks ranging from high-speed optical networks to ad-hoc wireless networks, each of them suited to different user requirements, geographies and socio-economic characteristics of countries, regions and people
- The flexibility of the Internet to accommodate new network technologies starts from the layering principle, which separates the end-to-end routing of IP traffic from the underlying network technologies.
- The network of networks principle allows networks to be developed and run independently and with different network technologies

Adaptability



Percentage of websites using HTTPS [Source: W3Techs, 2021]

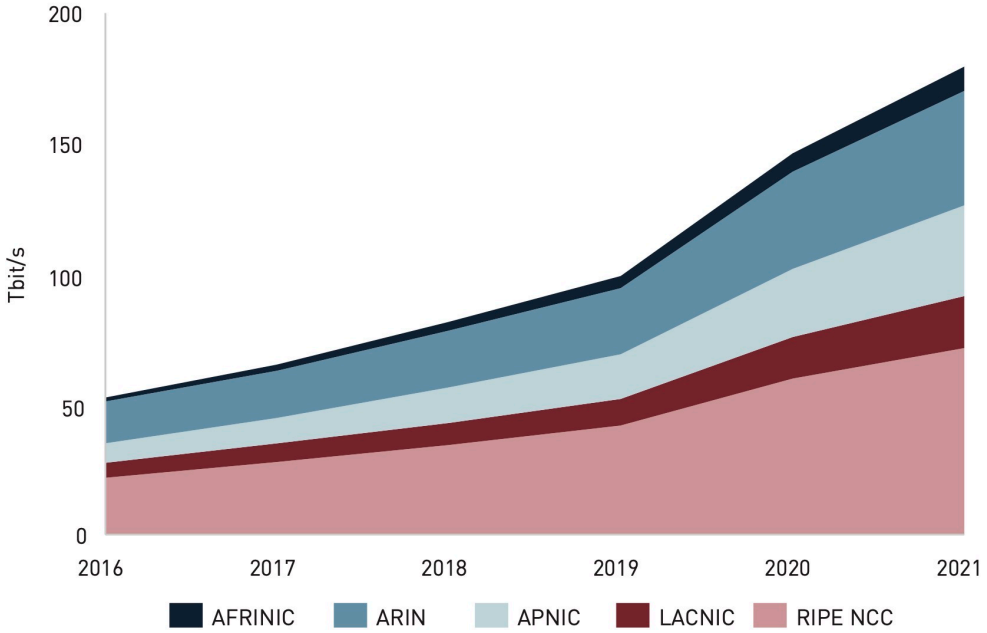


Percentage of websites using QUIC [Source: W3Techs, 2021]

- The Internet is adaptable in that it keeps supporting new applications that are continually emerging, including services historically provided by dedicated networks (converged communications and broadcast services) as well as newly digitised and networked services such as online banking, remote health, and ride sharing.

- Layering and the end-to-end principle are central to supporting a wide range of applications.

Resilience



Average international traffic by RIR region, as of mid-year [Source: Telegeography, 2021]

- The Internet has proven to be resilient over time in the face of noteworthy internal changes and external challenges.
- The resilience of the Internet stems both from fundamental technical properties such as the simple and distributed nature of Internet routing protocols, and from operational practices and methods that have been developed over time by network operators. Resilience also encompasses some measures that violate the technical design principles in response to challenges, without fundamentally altering the nature of the Internet.

What are the biggest threats?

Governments

As the importance of the Internet grows, governments will inevitably try to gain some level of control

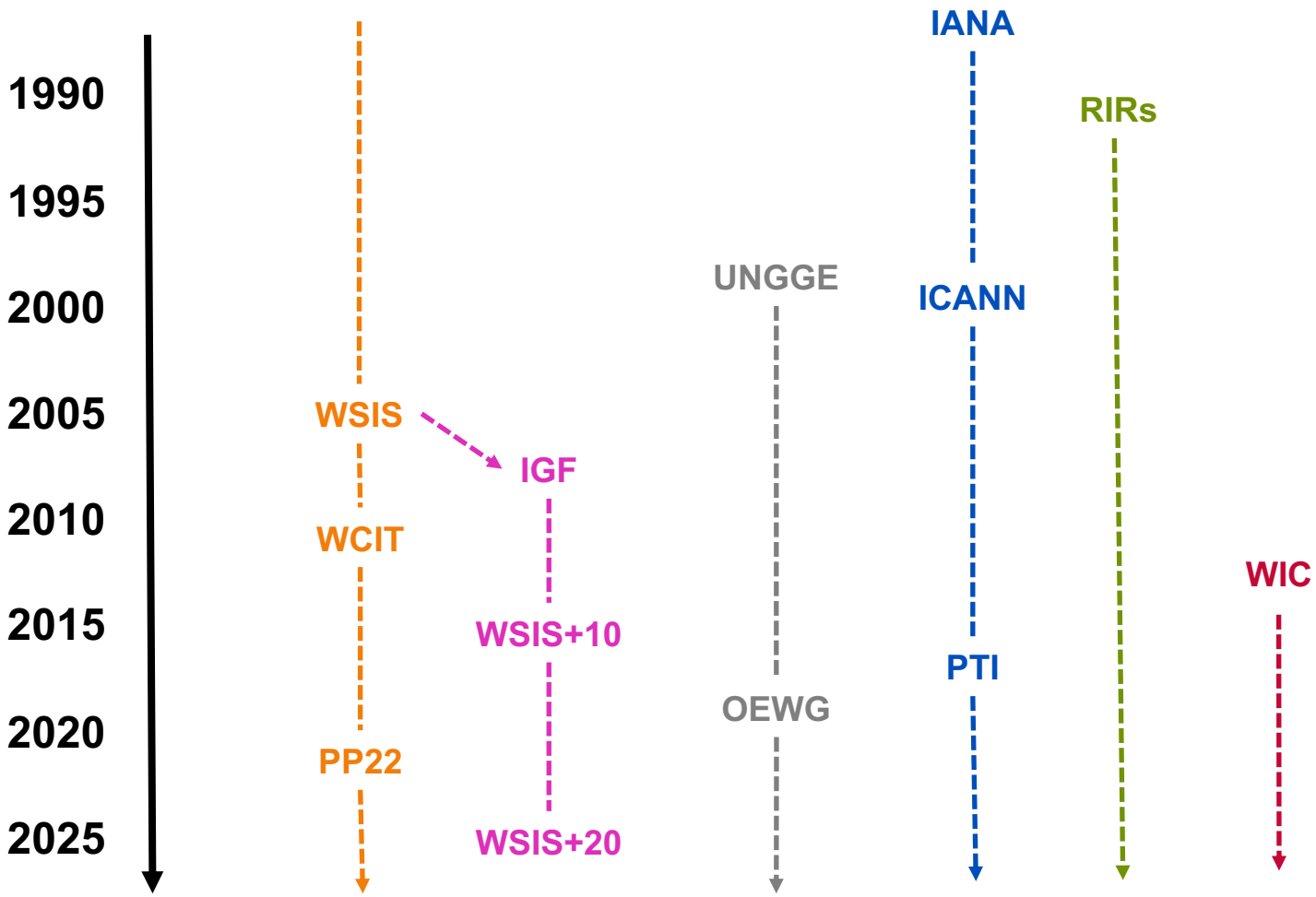
Internet giants

Content providers play an increasing role in both physical network and protocol development

What is the Internet going to look like in the future?

Multilateral & Multistakeholder

- Multilateral and multistakeholder worlds have worked independently over the last 30+ years
  - Their processes and procedures are mostly not interoperable
- There is need for more!
  - Preventing fragmentation require mutually reinforcing mechanisms between multilateral and multistakeholder processes.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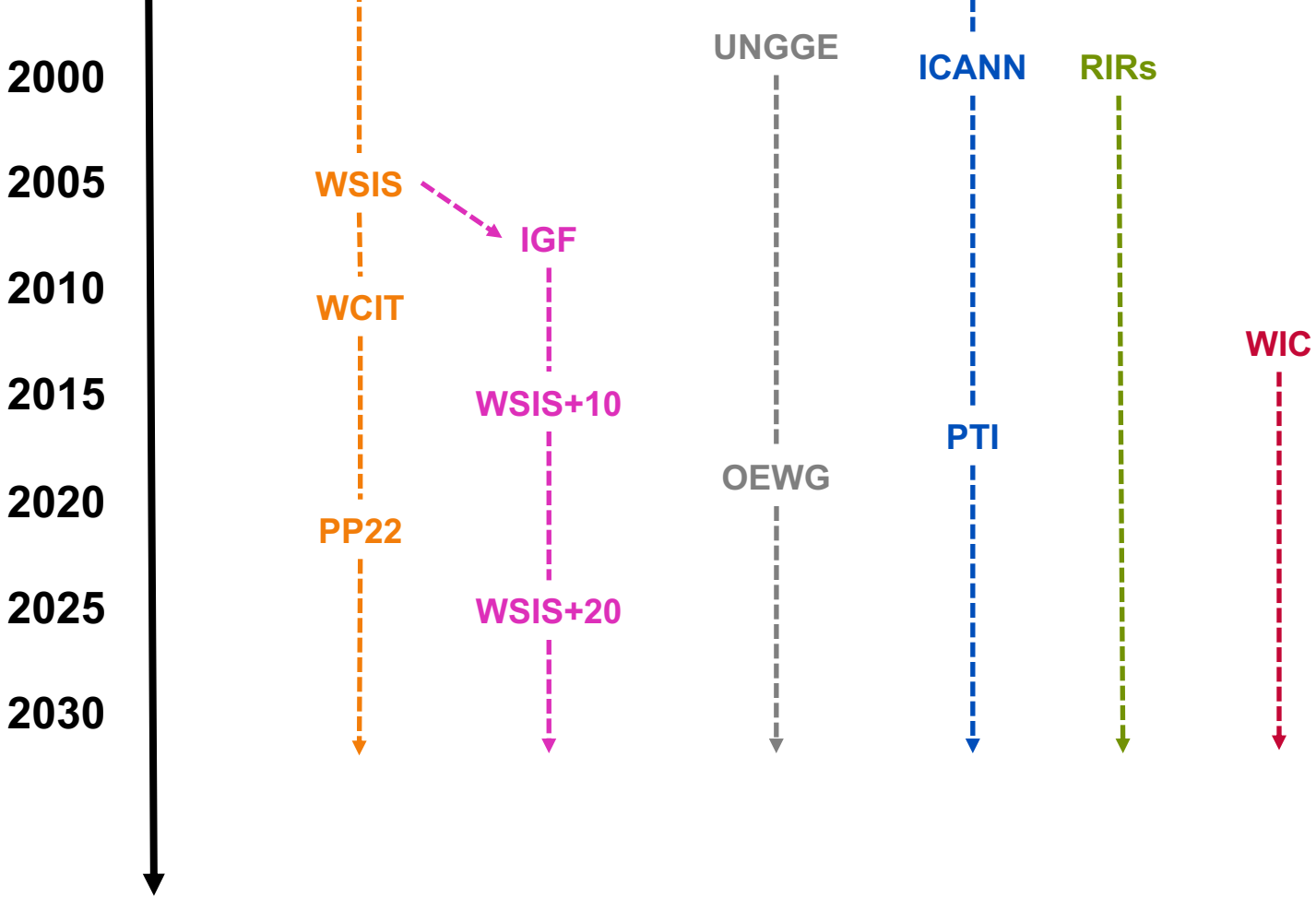
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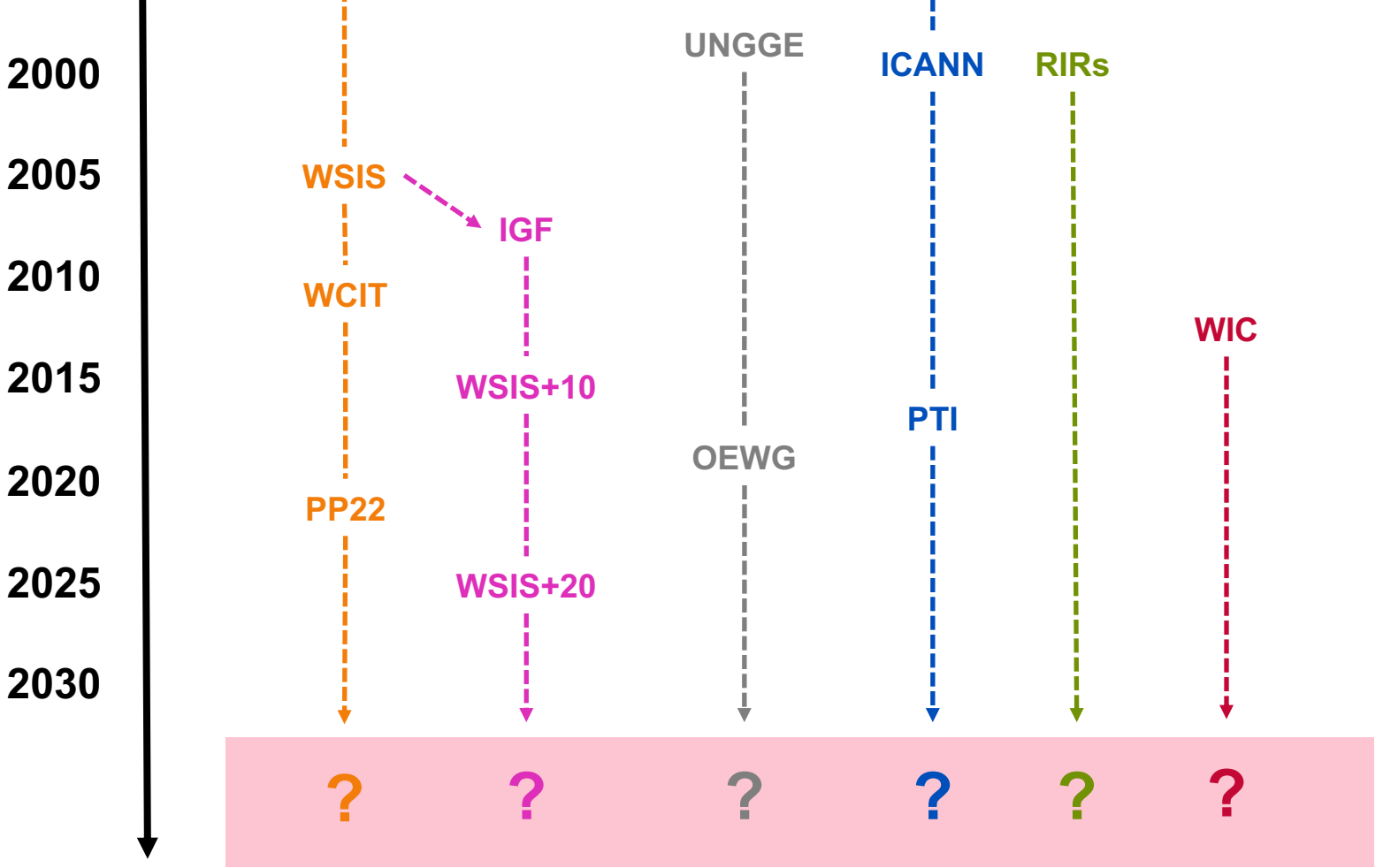
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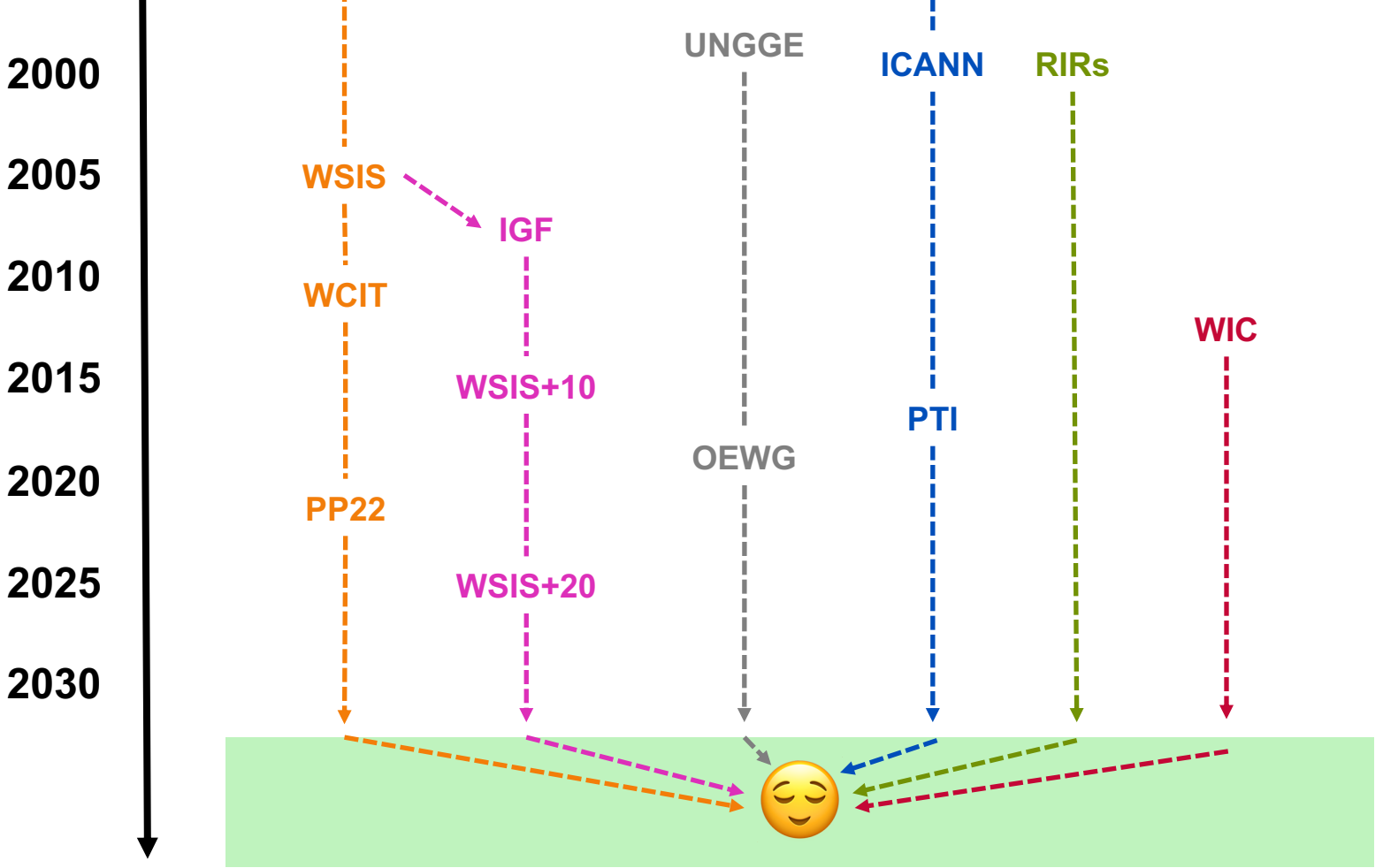
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Thank you!