Commercial considerations in IP interconnection agreements

March 2014

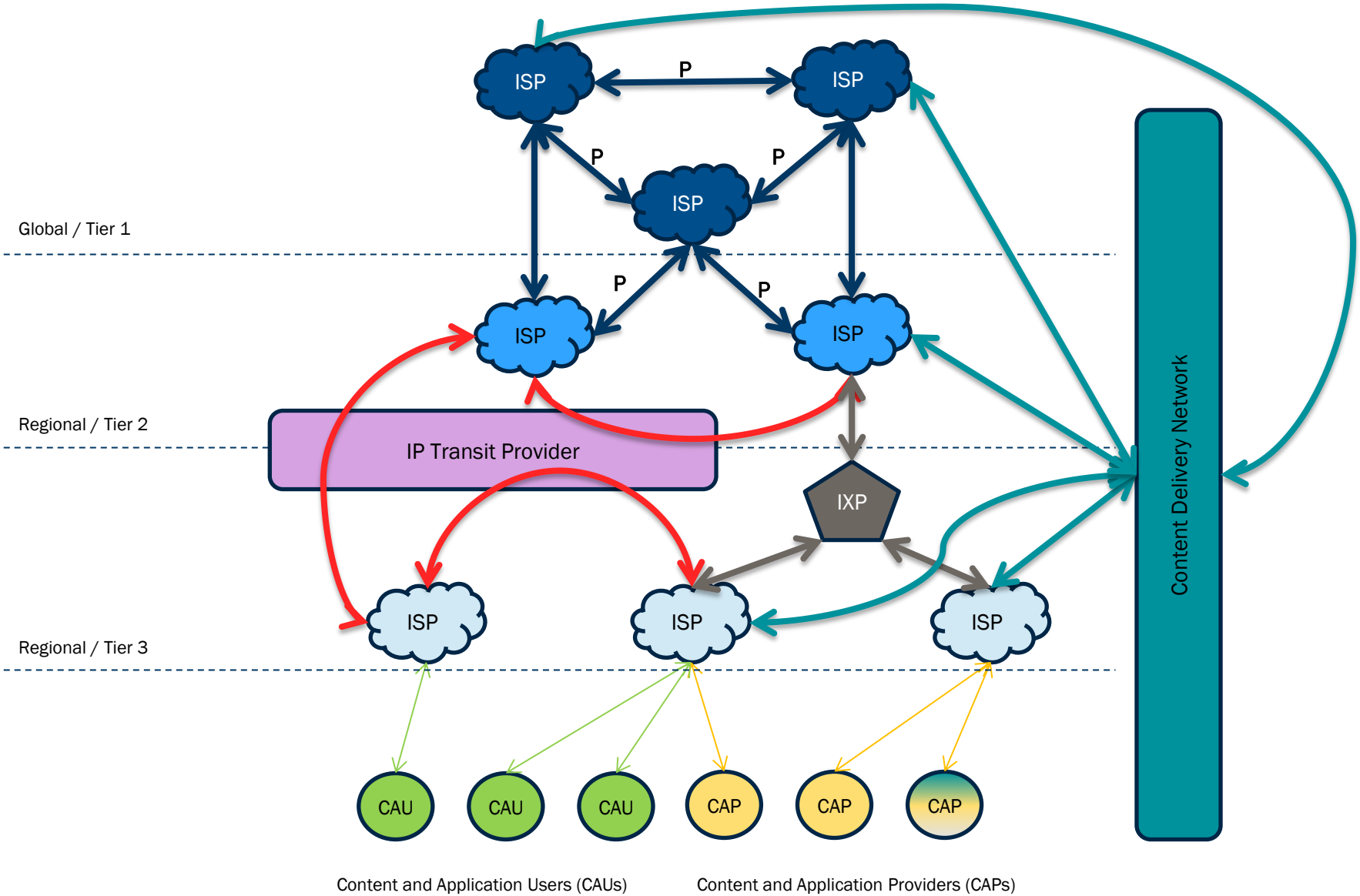
A review of the key commercial issues determining how interconnection agreements will be settled in practice

Agenda

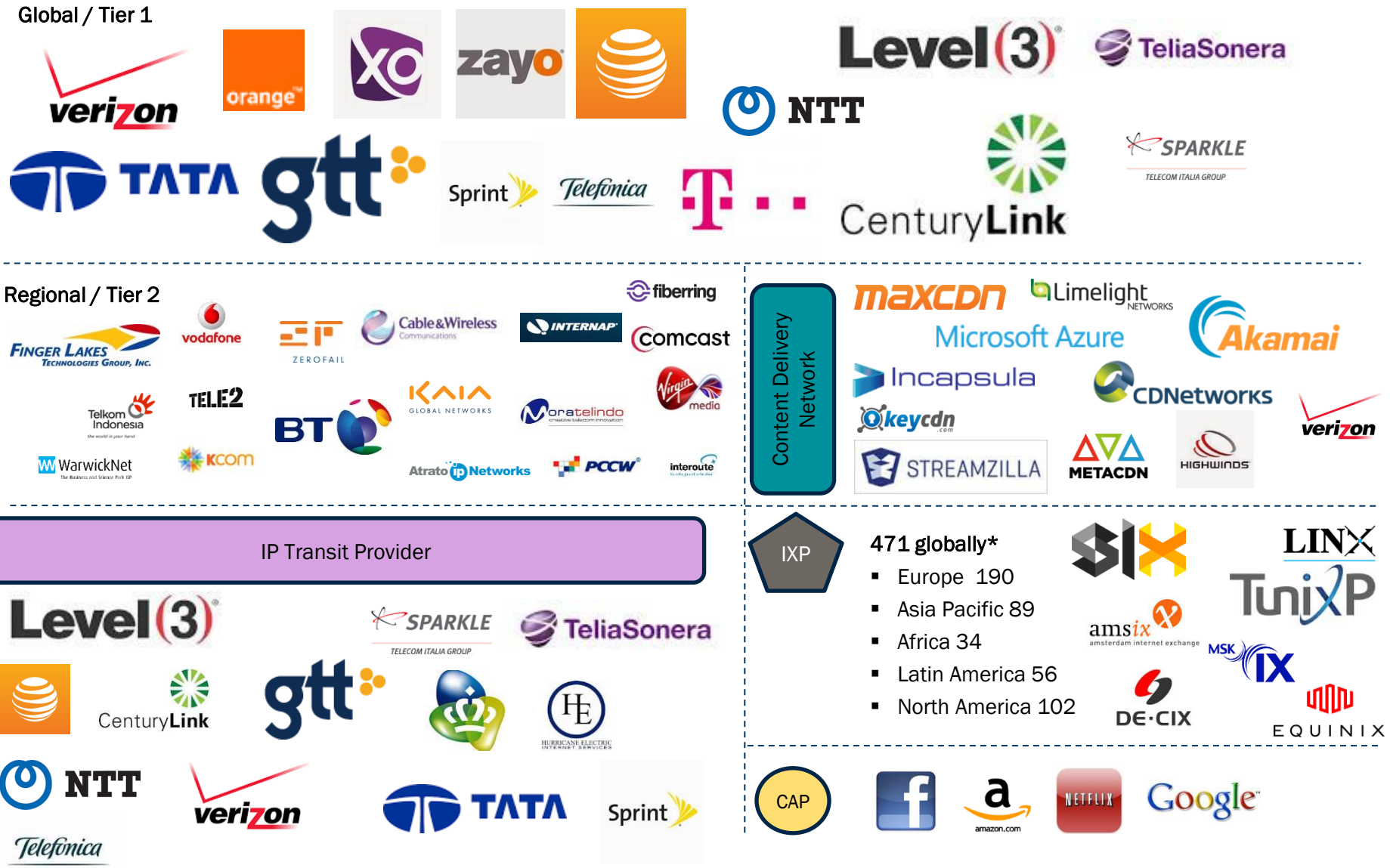
- The IP Interconnection commercial value chain
- The Who's Who of IP Interconnection
- Traditional commercial interconnection models
  - Peering v Transit
  - The business case for peering
  - The shape and form of peering agreements
  - Internet Exchange Points (IXPs)
- VoIP Interconnection
  - Industry working to develop standards
  - Case Study – Verizon's VOIP Interconnection template
  - GSMA's GRX and IPX standards
- Taking a look forward – the implications of VoLTE for IP Peering agreements

Understanding the commercial IP interconnection value chain

An overview

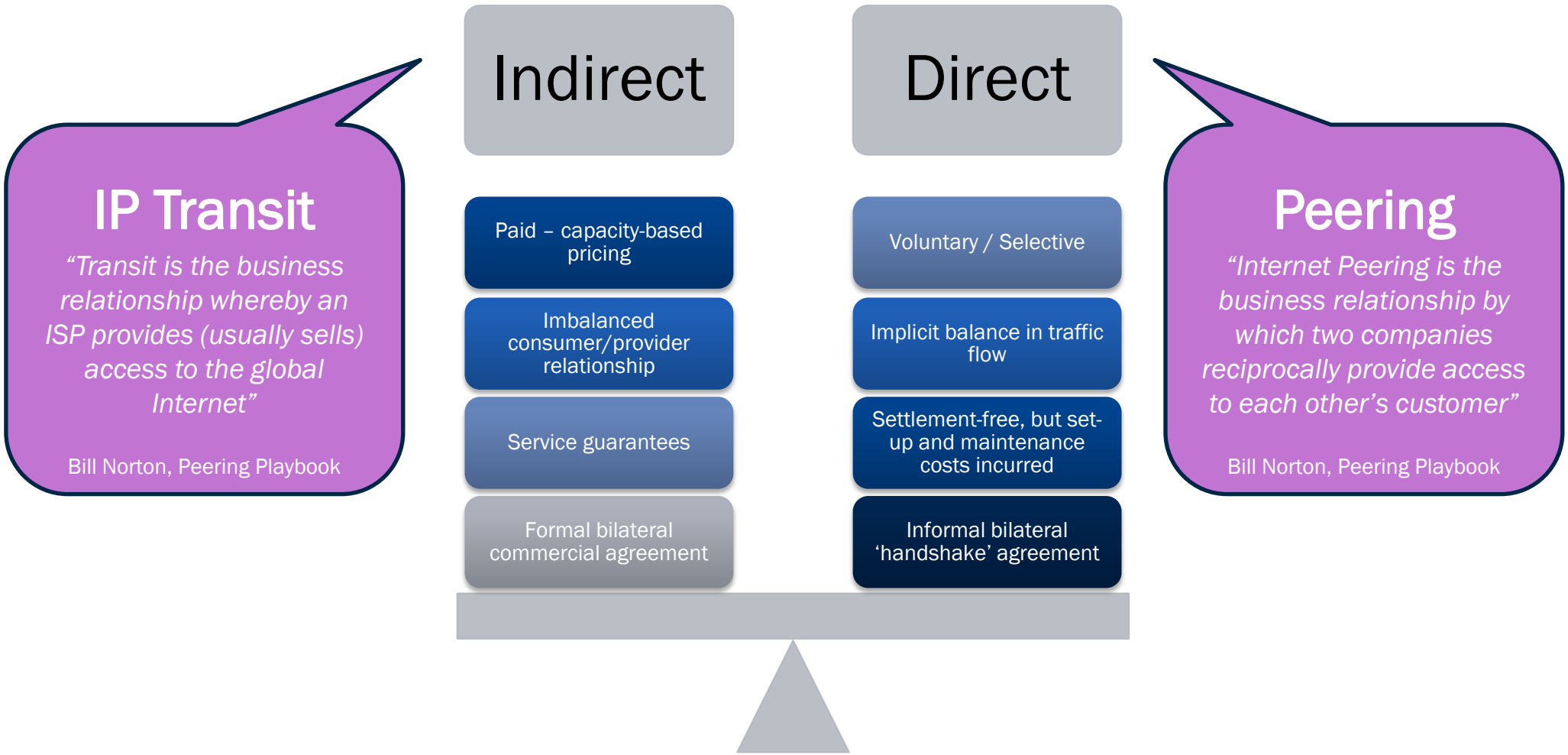


Understanding the commercial IP interconnection value chain
Who's who?



* https://www.euro-ix.net/resources-list-of-ixps

Traditional commercial models for IP Interconnection



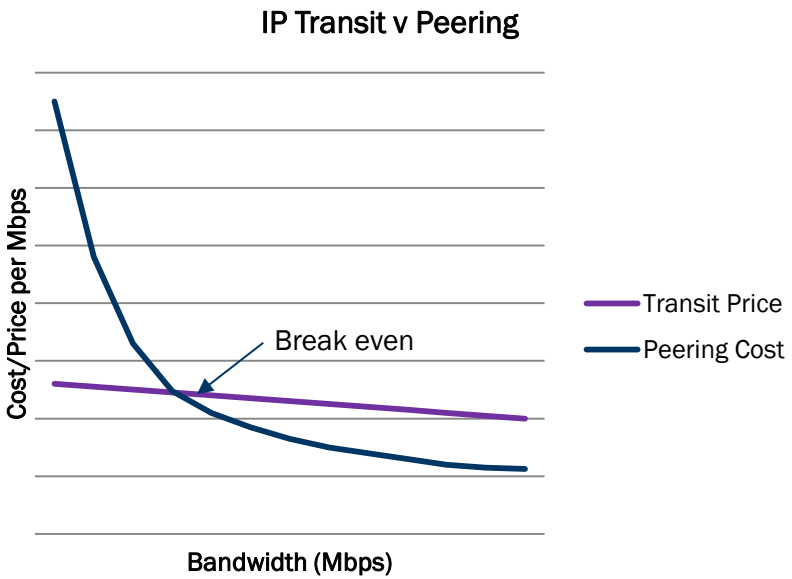
The Peering Business case - costs and benefits

Benefits

- Avoiding high traffic sensitive costs associated with IP Transit
- Increased control over network routing and resilience
- Reduced delay (latency)

Costs

- Up front and maintenance costs
  - **Transmission Links** - routing the traffic to the peering location
  - **Colocation** – cost of accommodation and facilities associated with hosting network equipment in a physical location
  - **Ports** – for example when peering takes place at public Internet Exchange points
  - **Electronics** – the routers/switches used to handover internet traffic



Commercial considerations are increasingly being reflected in the definition of parties' peering policies*

Traffic ratios	• Specification of inbound to outbound traffic ratios (typically between 3:1 and 1.8:1**)
Traffic volumes	• Specification of minimum traffic volumes/link capacities
Geographic reach	• Specification of the points at which traffic can be handed over vis-à-vis 'hot potato routing'
Geographic balance	• As an additional geographic consideration, parties may seek to balance the distribution of traffic across their networks
Announcement consistency	• Consistent Border Gateway Protocol announcements across peering links enable 'hot potato routing'
Service levels	• Encompassing a range of service-specific, quality of service and availability factors
Other customer factors	• Some parties may specify minimum customer metrics to ensure that there is enough traffic to justify the transaction costs incurred in peering.

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* BEREC, An Assessment of IP Interconnection in the context of Net Neutrality, 2012

** Liberty Global/ADL, The Future of the Internet – Innovation and Investment in IP Interconnection, 2014

Interconnection agreements in practice

- By the time the OECD published a 2013 report on Internet Traffic Exchange there were 5000 ISPs or carrier networks. 86% of these responded to the survey.
  - 142,210 individual agreements were identified
  - 141,512 were 'handshake' agreements based on informal, commonly agreed, terms
  - 141,836 had symmetric terms

- Of the 4,331 responding parties:
  - 2,696 (62%) said they interconnected with ten or fewer other parties
  - 12 said they had more than 700 agreements!

- Major multilateral peering agreement (MLPA) sites in Hong Kong, Warsaw and Frankfurt were highlighted, demonstrating that peering is no longer an entirely bilateral practice

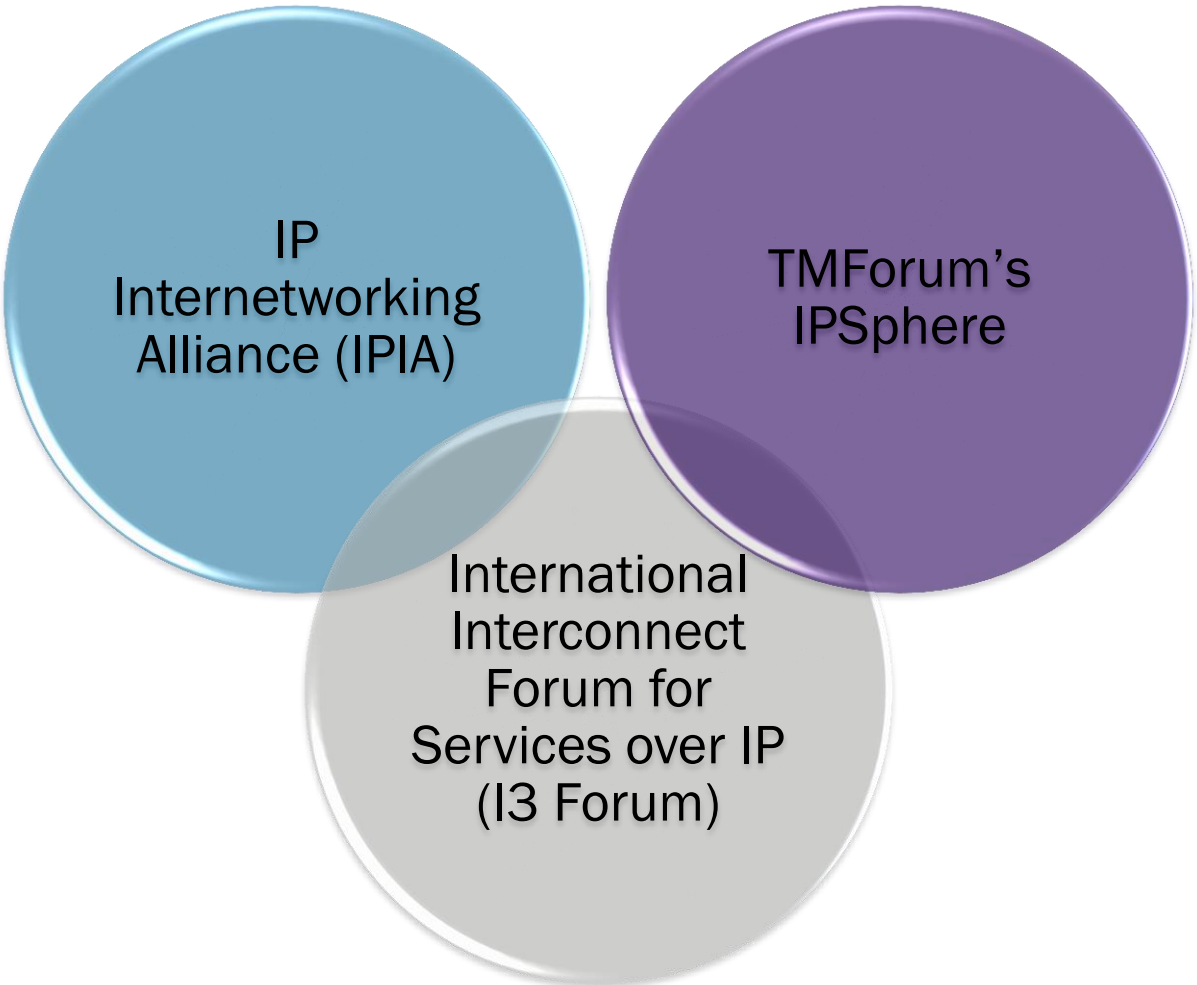
*Weller, D. and B. Woodcock (2013), "Internet Traffic Exchange: Market Developments and Policy Challenges", OECD Digital Economy Papers, No. 207, OECD Publishing. http://dx.doi.org/10.1787/5k918gpt130q-en

Internet Exchange Points (IXPs)

*Weller, D. and B. Woodcock (2013), "Internet Traffic Exchange: Market Developments and Policy Challenges", OECD Digital Economy Papers, No. 207, OECD Publishing. http://dx.doi.org/10.1787/5k918gpt130q-en

VoIP Interconnection:
Industry collaborating to define standards for VoIP interconnection

- The additional demands raised by VoIP interconnection have led to an increase in the need for some degree of common technical and commercial standards and ways of working. With this in mind the interconnecting parties work together in three key forums.*



* TATA Communications, VOIP Interconnect, 2010

VoIP Interconnection – Verizon Case Study
Key components of commercial VoIP interconnection agreements

Verizon's template (shared with the FCC in January 2014*), provides an informative template for commercial VoIP interconnection agreements.

1. IP Interconnection Specifications

2 .Session Initiation Protocol (SIP) Interconnection Plan

3. Non Disclosure Agreement

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* http://apps.fcc.gov/ecfs/document/view?id=7521065250

VoIP Interconnection – Verizon Case Study
1. *IP Interconnection Specifications (Part 1 of 2)*

In addition to general terms and conditions, and a glossary of terms, VoIP Interconnection Agreements will cover a range of technical and commercial elements

Points of interconnection

Scope of traffic

Codecs and transcoding

VoIP Interconnection – Verizon Case Study
1. *IP Interconnection Specifications (Part 2 of 2)*

In addition to general terms and conditions, and a glossary of terms, VoIP Interconnection Agreements will cover a range of technical and commercial elements

Service quality and disaster recovery

Pricing attachment

Ancillary Services

VoIP Interconnection – Verizon Case Study
2. *SIP Interconnection Plan – Part 1 of 2*

The SIP Interconnection Plan element of the agreement will need to incorporate the technical and operational details that interconnecting companies will be required to reach agreement on.

SIP Profile

The SIP profile sets out the hardware and software versions of the interconnecting parties' respective IP nodes and the SIP signalling parameters that the parties plan to support for call setup and delivery. *

Media Profile

The Media Profile specifies the port ranges for the delivery of voice media, the expected codec, and the format for delivery of facsimiles.

Points of Interconnection (POI)

The POI section specifies the interconnection points at which the parties will interconnect. The specification includes the number and physical locations of each POI, the bandwidth for the cross connect(s) at each POI and the method for sharing the costs of the cross-connects at each POI.

Interconnection Checklist

The interconnection checklist provides details of each interconnection point, such as hub/node designation, router assignment and circuit information

VoIP Interconnection – Verizon Case Study
2. *SIP Interconnection Plan – Part 2 of 2*

The SIP Interconnection Plan element of the agreement will need to incorporate the technical and operational details that interconnecting companies will be required to reach agreement on.

VLANs

The VLANs section specifies the agreed IP addresses and subnets for exchanging signalling information and media.

Routing Tables

The Routing Tables specify each parties' routing options for terminating traffic to each parties' respective VoIP customers.

Traffic Forecasts

Each party is required to provide forecasts of the initial exchange of live traffic over the IP interconnection arrangement, disaggregated by Local Routing Numbers.

Testing and Disaster Recovery Plans

The Testing and Disaster Recovery Plans specify how the interconnecting parties will undertake initial and ongoing testing, including success criteria, including a mutually agreed approach to managing disaster recovery issues.

VoIP Interconnection – Verizon Case Study
3. *Non Disclosure Agreement*

Interconnecting parties will be required to exchange information that would otherwise be considered commercially sensitive.

It is essential that companies exchange proprietary and competitively sensitive information in order to design and implement an efficient IP interconnection arrangement.

Detailed traffic data

IP network component locations

Codecs

Detailed call routing information

Looking forward -
What should next generation IP peering agreements include?

- Enable any-to-any interconnect (TDM, legacy IP and SIP)
- Support growing multimedia trends (IMS and RCS)
- Support both telephone numbers and user decoupling from devices (SIP URIs)
- Enable settlement free peering enhancing service differentiation
- etc…

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* http://apps.fcc.gov/ecfs/document/view?id=7521065250