Pricing, billing and interconnection in an Next Generation Networks (NGN) environment

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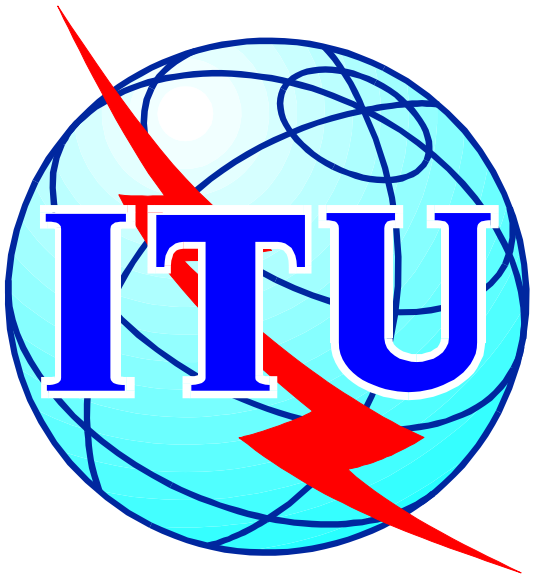

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Agenda: NGN Interconnection

Networks

- **Why NGN?**
  - What is a Next Generation Network?
  - Why should we migrate from today's networks to tomorrow's NGN?

Tools

- **Basic Interconnection principles**
  - Traditional interconnection models
  - Traditional billing and revenue-sharing models
  - The trend towards bundling and flat-rate pricing

Strategies

- **Getting to there from here**
  - Complexity versus simplicity
  - Mobile versus fixed termination
  - IP versus PSTN call termination

What is an Next Generation Network?

Networks

Today's PSTN network	Next Generation Networks
• Circuit-switched.	• Packet-based, based on Internet Protocol (IP).
• Limited mobility of end-user services.	• Broad-based 'generalised mobility'.
• Vertical integration of application and call control layers, with dedicated networks.	• Horizontally-integrated control layers, with simultaneous delivery of applications. Service-related functions independent of transport-related technologies.
• Non-responsive network.	• NGN will be able to identify and adapt to user needs in real-time.

Source: ITU Internet Reports 2005: The Internet of Things

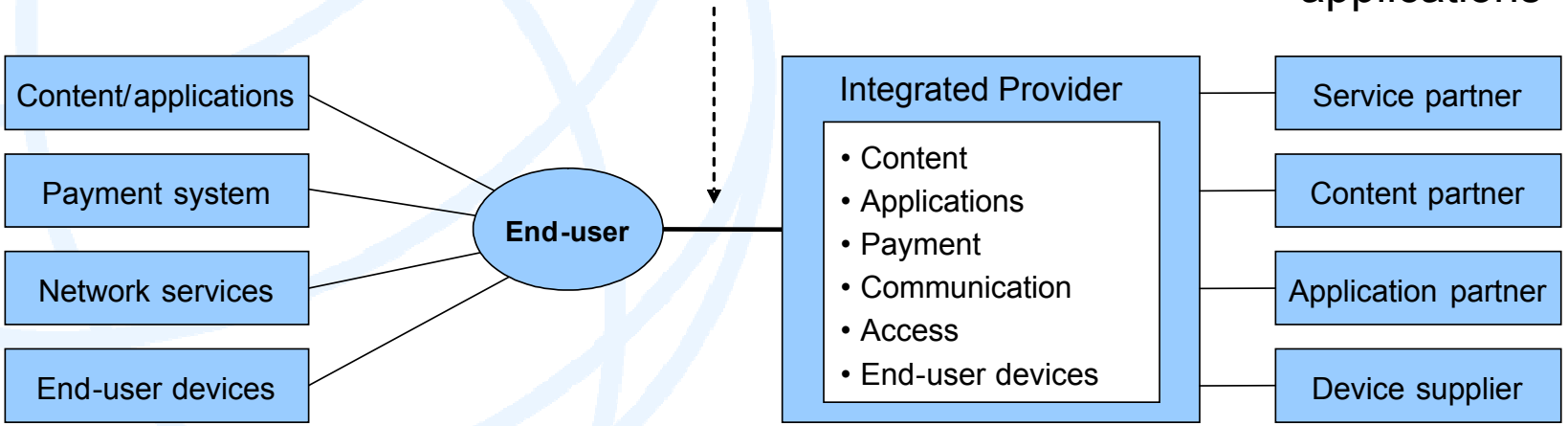
NGN migration implies integration and a "portable" user environment

Today:

Fragmented B2C relationships

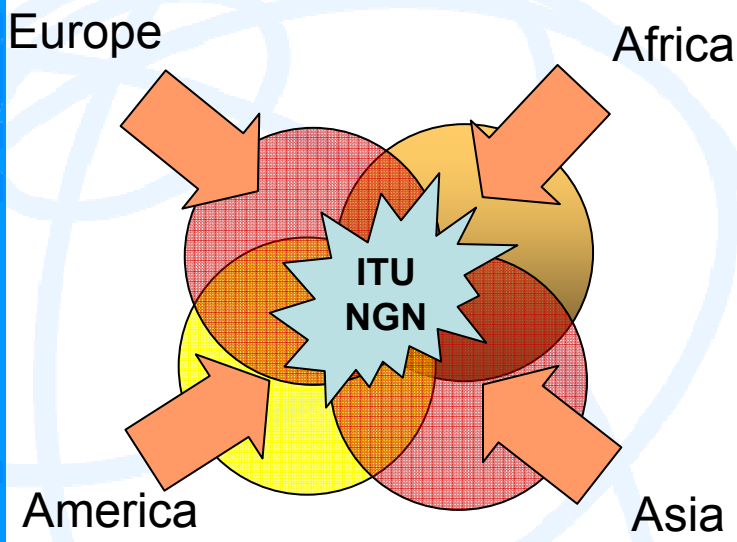
Tomorrow:

Bundling of all relevant B2C relationships and optimal supply of services, content and applications



Source: ITU (2006): "Regulating new and emerging markets in the telecom sector", background paper prepared by Christian Wey et al.

Standardization efforts towards NGN



Challenges

- Multimedia
- Generalized mobility
- Convergence
- Integrity
- Multi-layer orientation
- Open character

ITU-T SG 13: Rec. Y.2001

A NGN is a packet-based network able to provide telecommunication services and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies. It enables unfettered access for users to networks and to competing service providers and/or services of their choice. It supports generalized mobility which will allow consistent and ubiquitous provision of services to users.

FG NGN →

NEXT GENERATION NETWORK
NGN-GSI
GLOBAL STANDARDS INITIATIVE
ITU-T

SG: 11, 13, 19, 2, 12, 16, 17

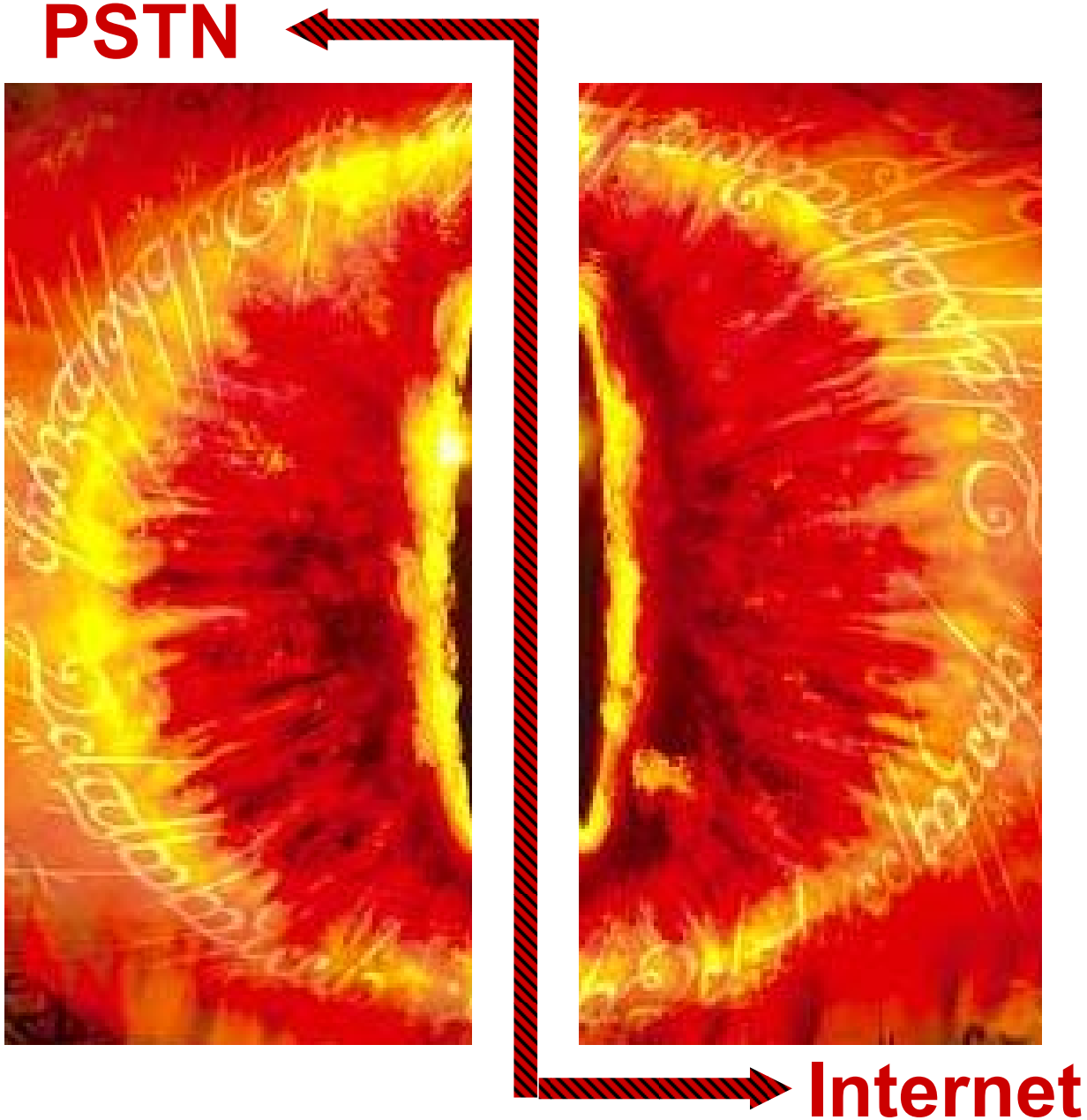
But, doubts persist over NGN

- NGN represents the marriage of the Telco and IP worlds. But will it be a collision?
- Is the NGN just another a telco attempt to recreate an “Intelligent Network” with centralised intelligence?
- Is the NGN primarily an overlay or a new-build?
- Is it just a clever marketing name?
- Who pays for what, where, when and to whom in an NGN environment?

The NGN vision?

One ring to rule them all …

The NGN reality: a world divided …



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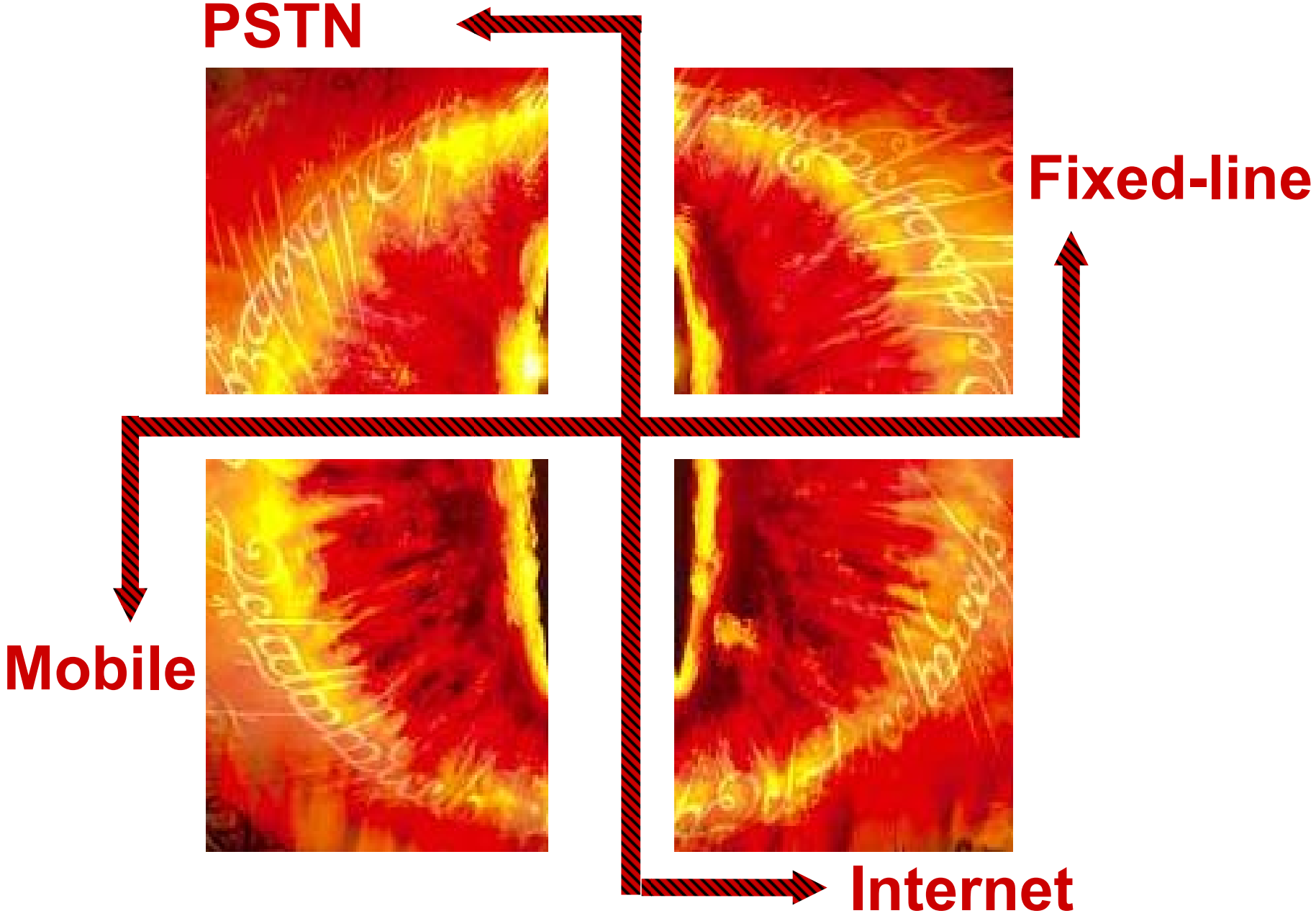

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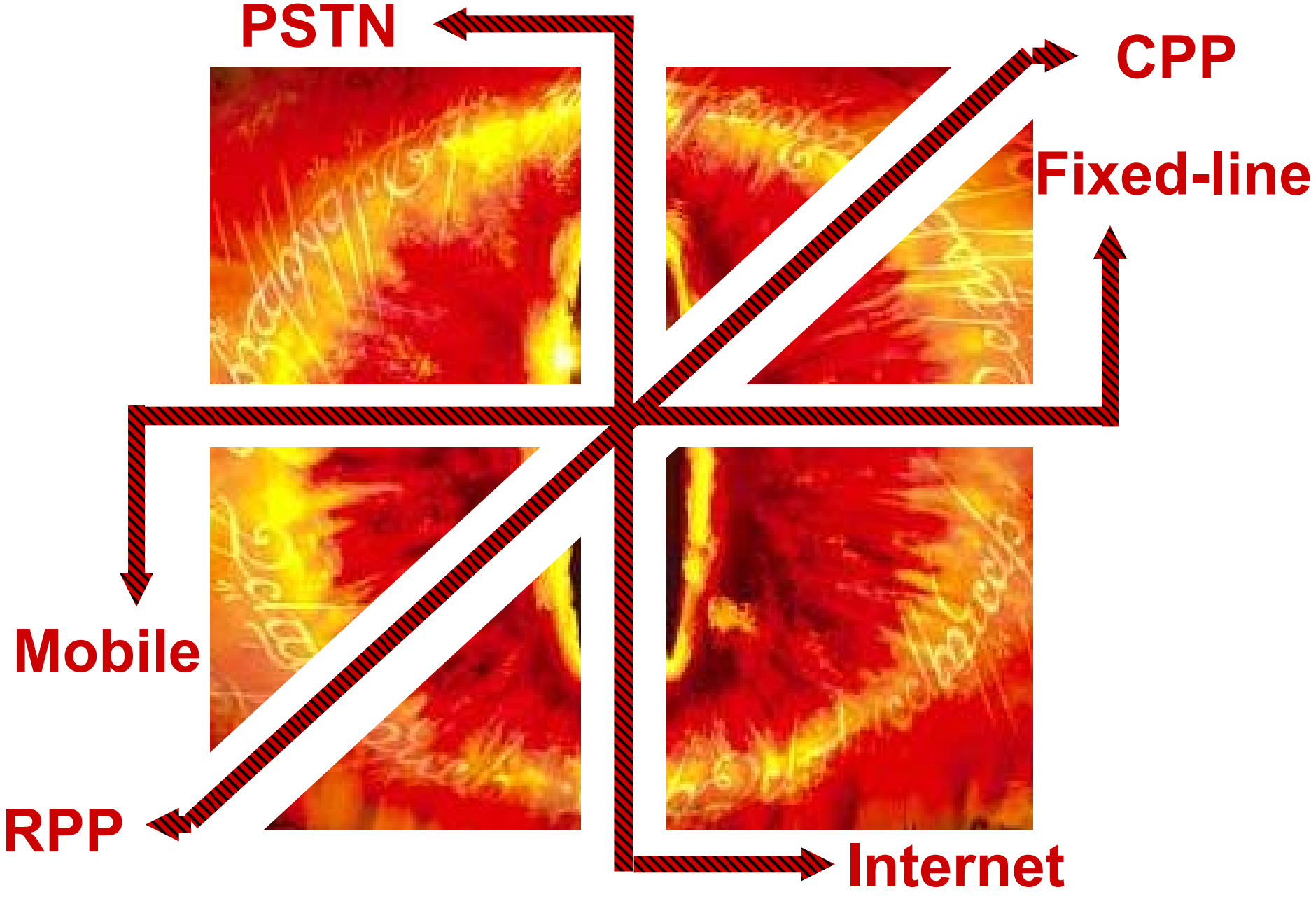

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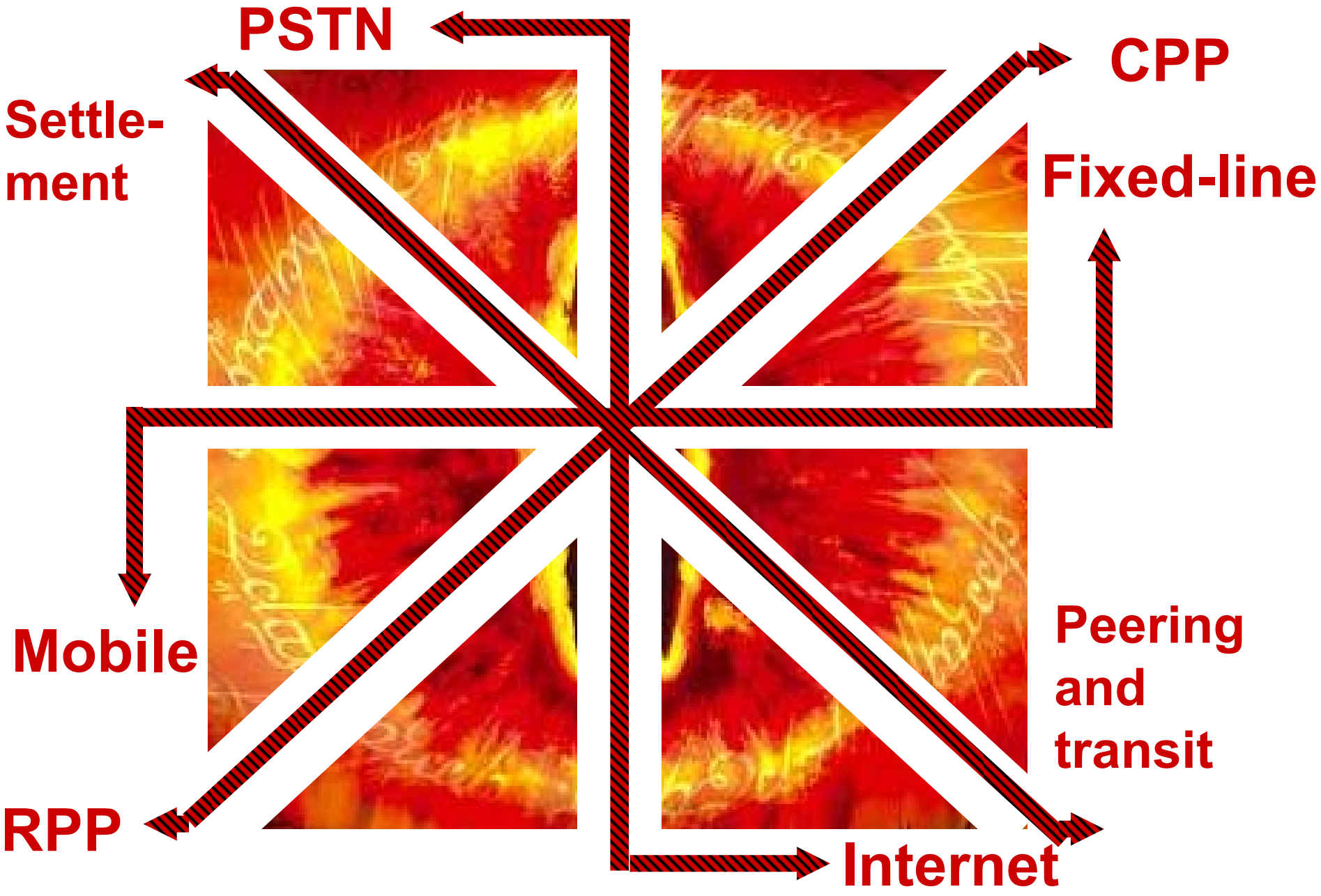
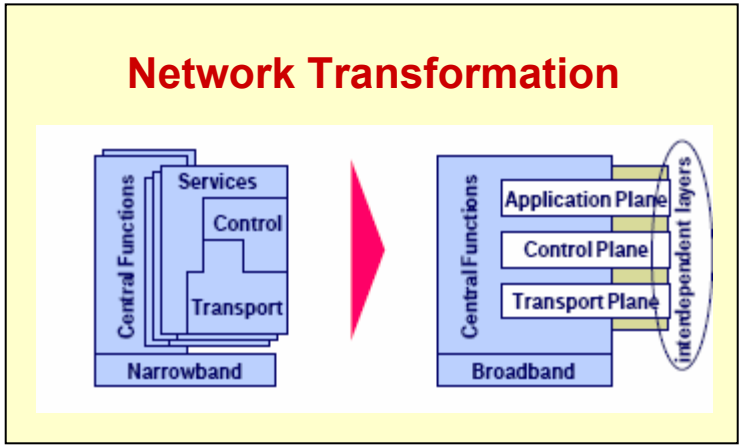


So, what might be the benefits of a Next Generation Network?

- **For the Operator:**
  - Lower costs in having a single IP-based network to invest in and maintain
  - Single billing contact with the customer ("*internet with billing*")
  - Possibility to act as gateway for billing for content and applications from 3rd party providers
  - Reduced costs of legacy network maintenance
- **For the customer:**
  - Possibility to use the same customised environment between different platforms
  - Possibility of lower prices through bundled service offerings
  - Integration of own content (e.g., photos, music and video library, website) with that of service provider

What is driving NGN developments?

- **Financial performance**
  - Revenue growth & margin protection
  - Reduced OPEX and CAPEX
- **Operational issues**
  - Obsolescence & modernization
  - Reliability, resilience & quality
  - Capacity & scalability
  - Simpler and faster provision of new service roll-out
- **Convergence issues**
  - Fixed/mobile convergence
  - Voice/data convergence
  - Telecoms/broadcasting convergence
  - Shifting from narrowband to broadband



Tools

Interconnection possibilities

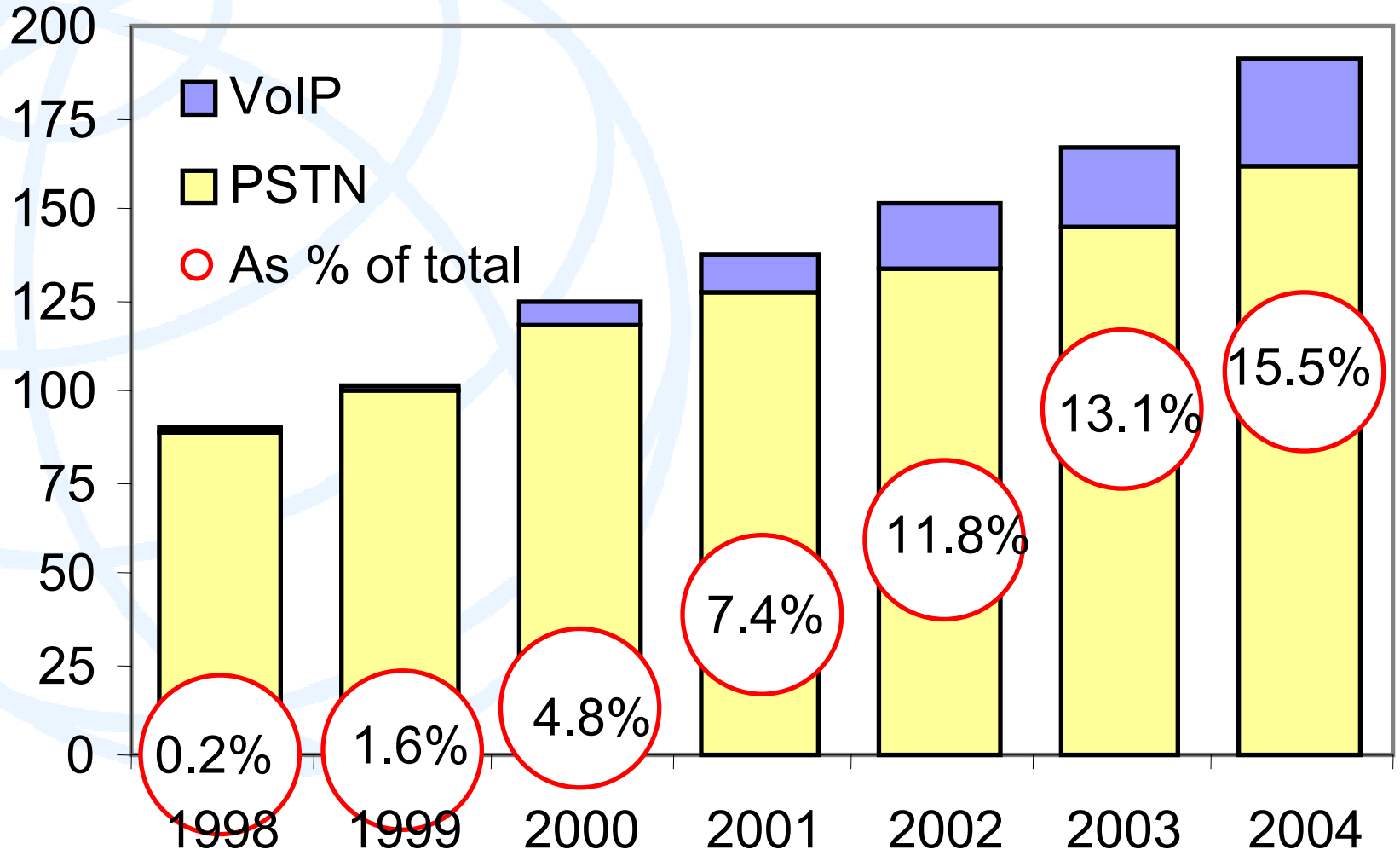
- **Traditional international accounting rates**
  - Symmetrical, negotiated bilateral arrangements for jointly-provided, switched telecommunication service
- **Interconnection**
  - Asymmetric rates for call termination/roaming
  - Fixed-to-fixed; fixed-to-mobile, mobile-to-fixed etc
- **Peering**
  - A bilateral arrangement to accept and terminate traffic (usually IP-based), generally without financial compensation
- **Transit**
  - An agreement to accept and terminate traffic on behalf of other carriers, for a price
- **Sender keeps all (Bill and Keep)**
  - Sending and receiving traffic without payment and (usually) without requirement for prior arrangements

International interconnection: Then and now

Accounting rates	*International interconnection rates*
Normally symmetric (accounting rate split 50/50)	Asymmetric (charges may vary between countries)
Bilaterally negotiated	Set unilaterally, but subject to trade discipline
Discriminatory by country of origin of call, but not by fixed/mobile	Discriminatory between fixed and mobile traffic, but not by country of origin of call
Half-circuit regime (not normally unbundled)	Full-circuit regime (can be unbundled)

International voice traffic

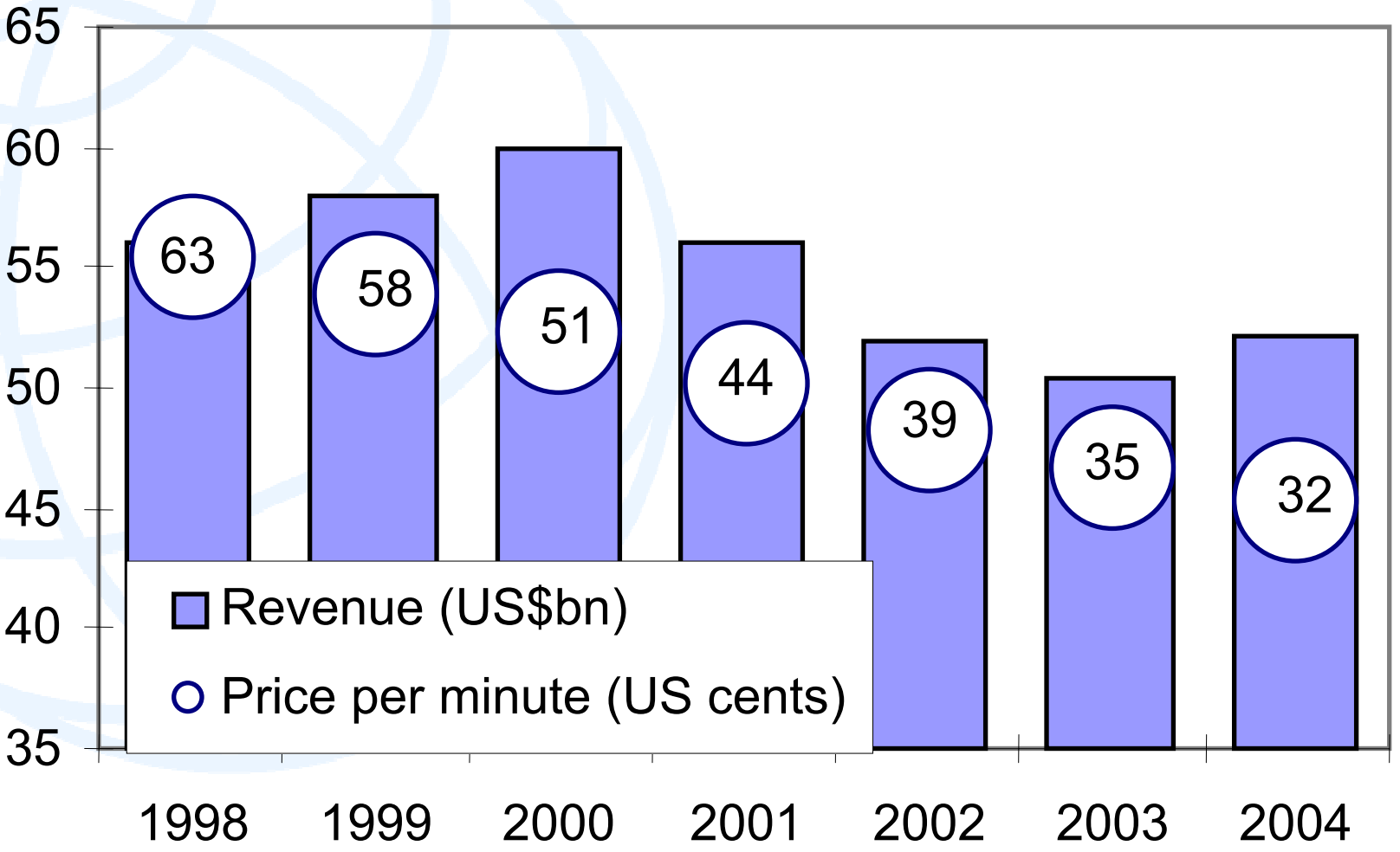
(in billions of minutes)



Source: ITU.

International voice traffic trends

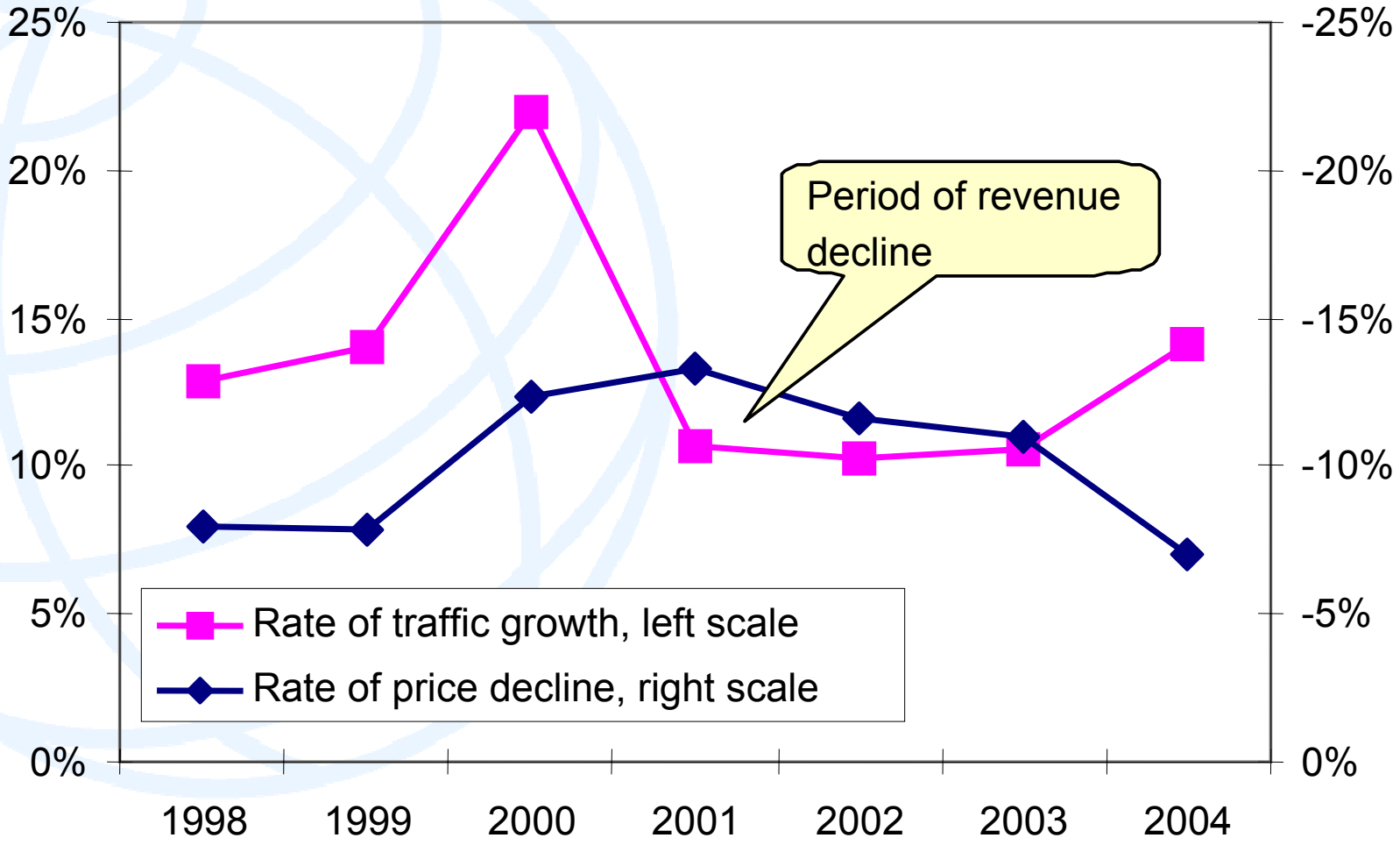
Revenue (US$bn) and price per min (cents)



Source: ITU World Telecom Indicators Database.

Is the crisis over now?

Int'l traffic growth and price decline, 1998-2004



Source: ITU.

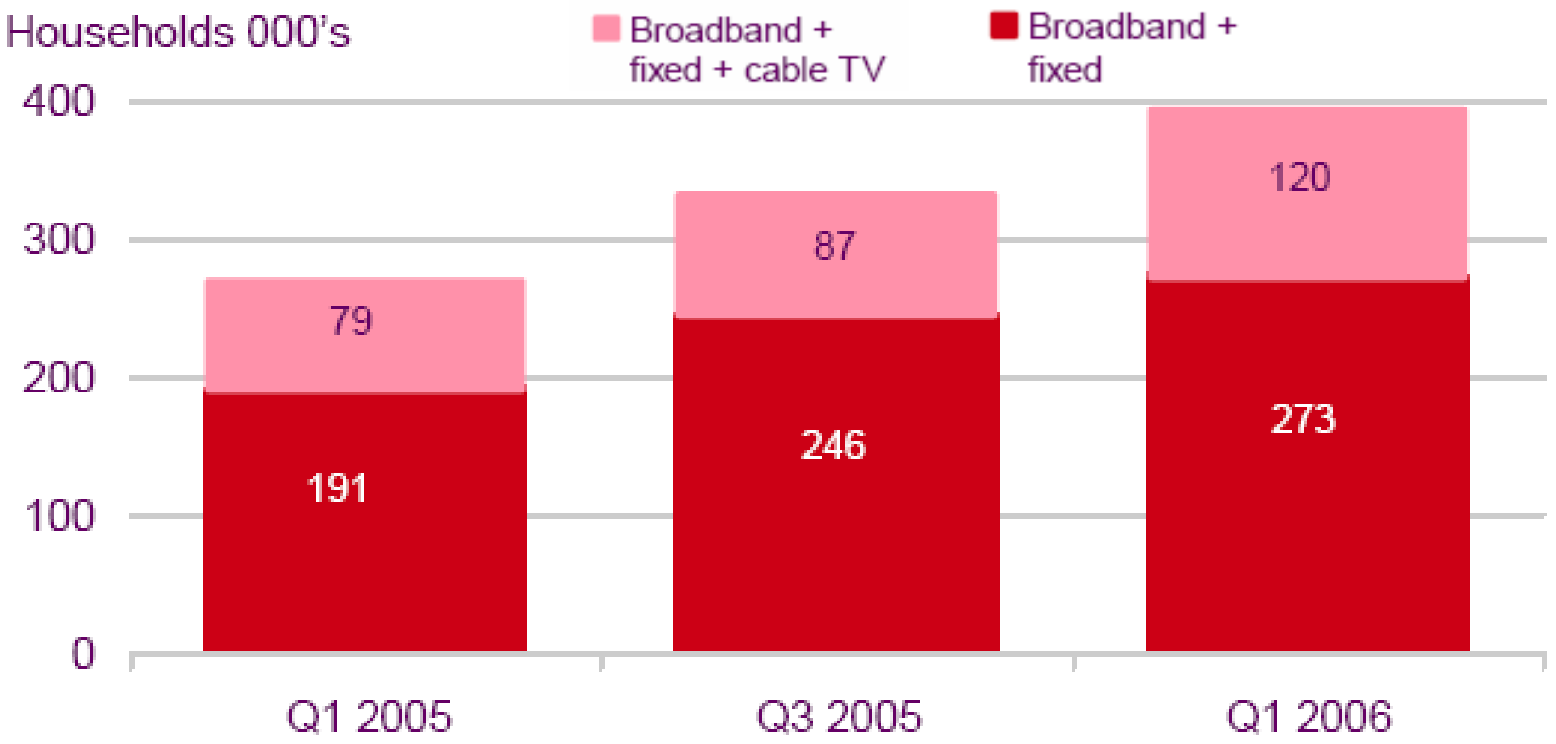
Based on total traffic and average price, derived from revenue per minute. Note, inverted scale for price declines

Revenue sharing and billing

- **Settlement rates**
  - Agreement to split wholesale accounting rate between carriers, usually on a 50/50 basis
- **Interconnection**
  - Charges levied for call termination, usually on a per-minute basis
- **Transit**
  - Charges levied for carrying traffic, usually on a capacity basis
- **Calling Party Pays (CPP)**
  - Call originating party pays full retail cost of the call
- **Receiving Party Pays (RPP)**
  - Both call originating and call receiving parties pay a share of the retail cost of the call

The trend towards bundling

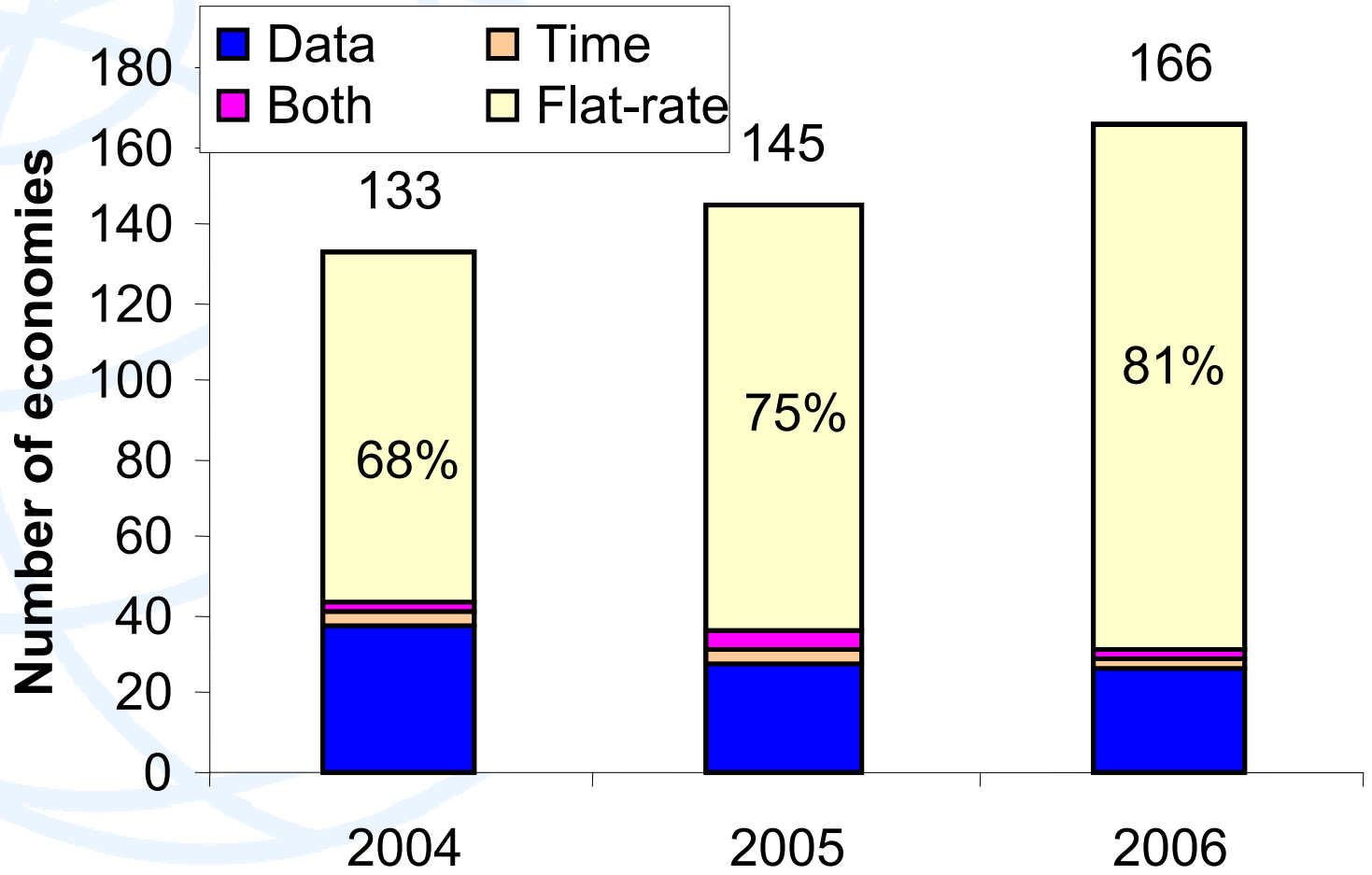
UK households taking bundled packages



Source: OFCOM

The trend towards flat-rate pricing

Global trends in broadband pricing schemes

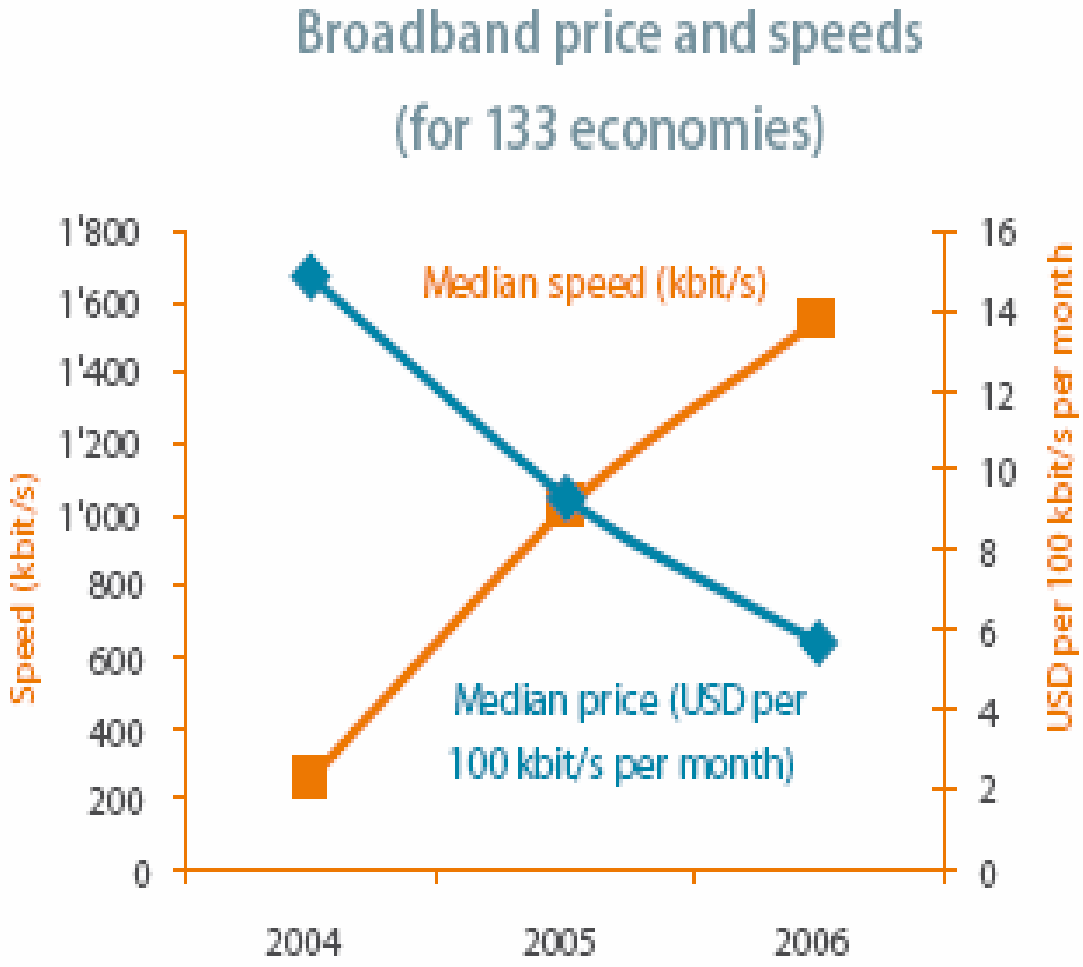


Note: Data" refers to price packages with bit caps. "Time" refers to time-metering . "Both" refers to packages with both data and time caps. "Fl rate" implies unlimited monthly use.

Source: ITU World Information Society Report 2006 (www.itu.int/wisr).

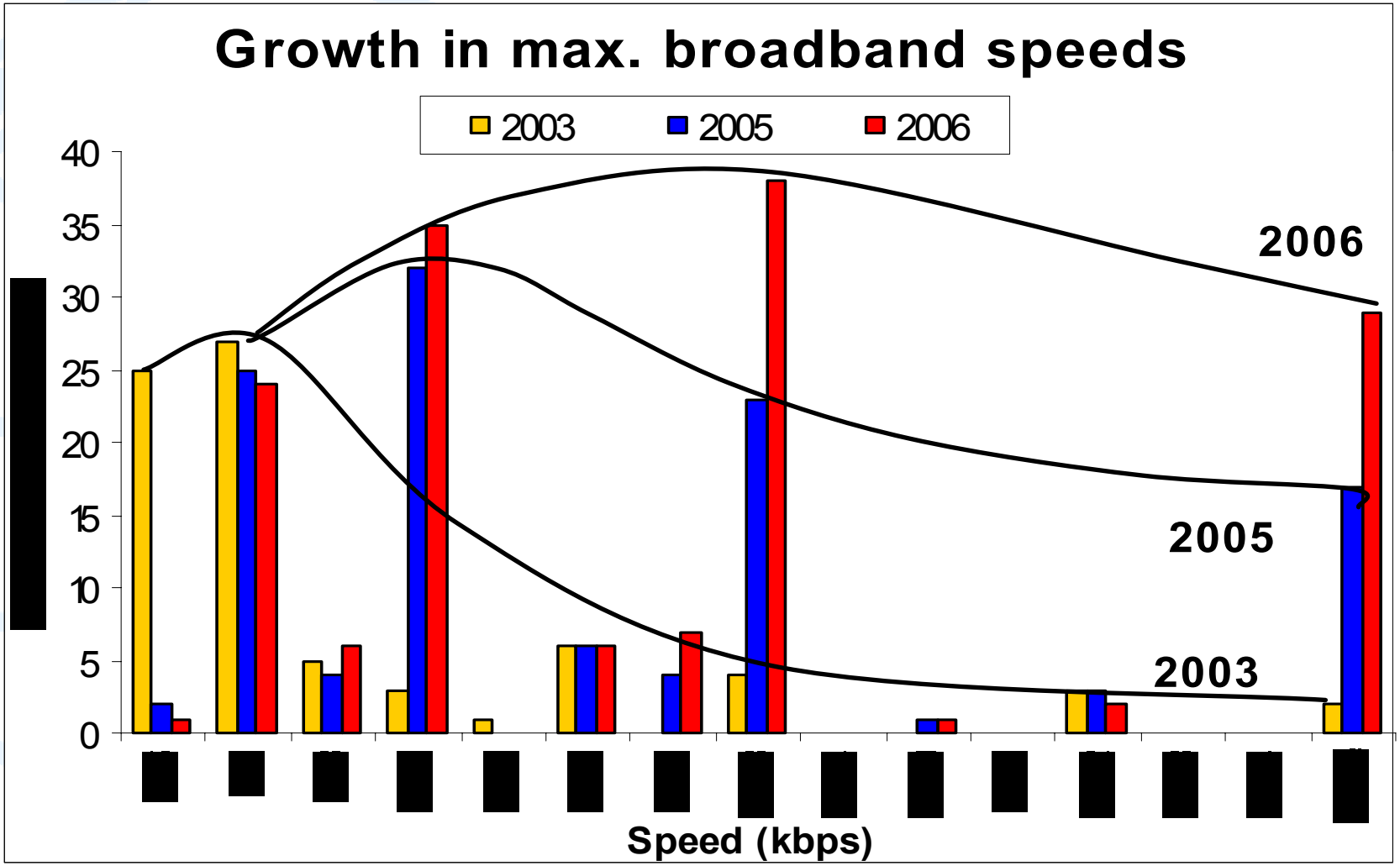
Trends in broadband pricing, global

- **International survey of broadband prices**
  - **Based on 133 economies that had broadband as early as 2004**
- **Methodology**
  - **Based on price in US$ per 100 kbit/s**
- **Price trends**
  - **Median price has fallen by 41% p.a.**
  - **Median speed has risen by 66% p.a.**
  - **Faster than Moore's Law**



Source: ITU Internet Reports 2006: Digital.Life.

Growth in broadband speeds



Source: ITU World Information Society Report 2006 (www.itu.int/wisr).

Prices in top 15 broadband economies

	Economy	Company	Speed Mbit/s	Price per month USD	Price per 100 kbit/s	Change 2005-06
1	Japan	Yahoo! BB	51.2	31.19	0.07	-12.5%
2	Rep. of Korea	Hanaro	51.2	40.59	0.08	...
3	Netherlands	Internet Access	20.4	27.97	0.14	-81.3%
4	Taiwan, China	Chunghwa	12.3	22.67	0.18	...
5	Sweden		24.6	56.08	0.23	-6.5%
6	Singapore	Starhub	30.7	73.17	0.24	-85.0%
7	Italy	Libero	12.3	37.23	0.30	-73.8%
8	Finland	Elisa	24.6	85.64	0.36	-51.4%
9	France	Free	10.2	37.29	0.36	-90.1%
10	United States	Comcast	4.1	20.00	0.49	...
11	Germany	Freenet.de	6.0	30.95	0.52	...
12	United Kingdom	Pipex	8.1	50.89	0.63	-53.6%
13	Hong Kong, China	Netvigator	6.1	51.17	0.83	...
14	Portugal	Sapo	8.1	75.82	0.93	...
15	Canada	Bell	4.0	41.26	1.01	-3.9%
	Unweighted Average		18.3	44.33	0.42	-50.8%

Source: ITU Internet Reports 2006: Digital.Life.

Strategies

NGN interconnection options

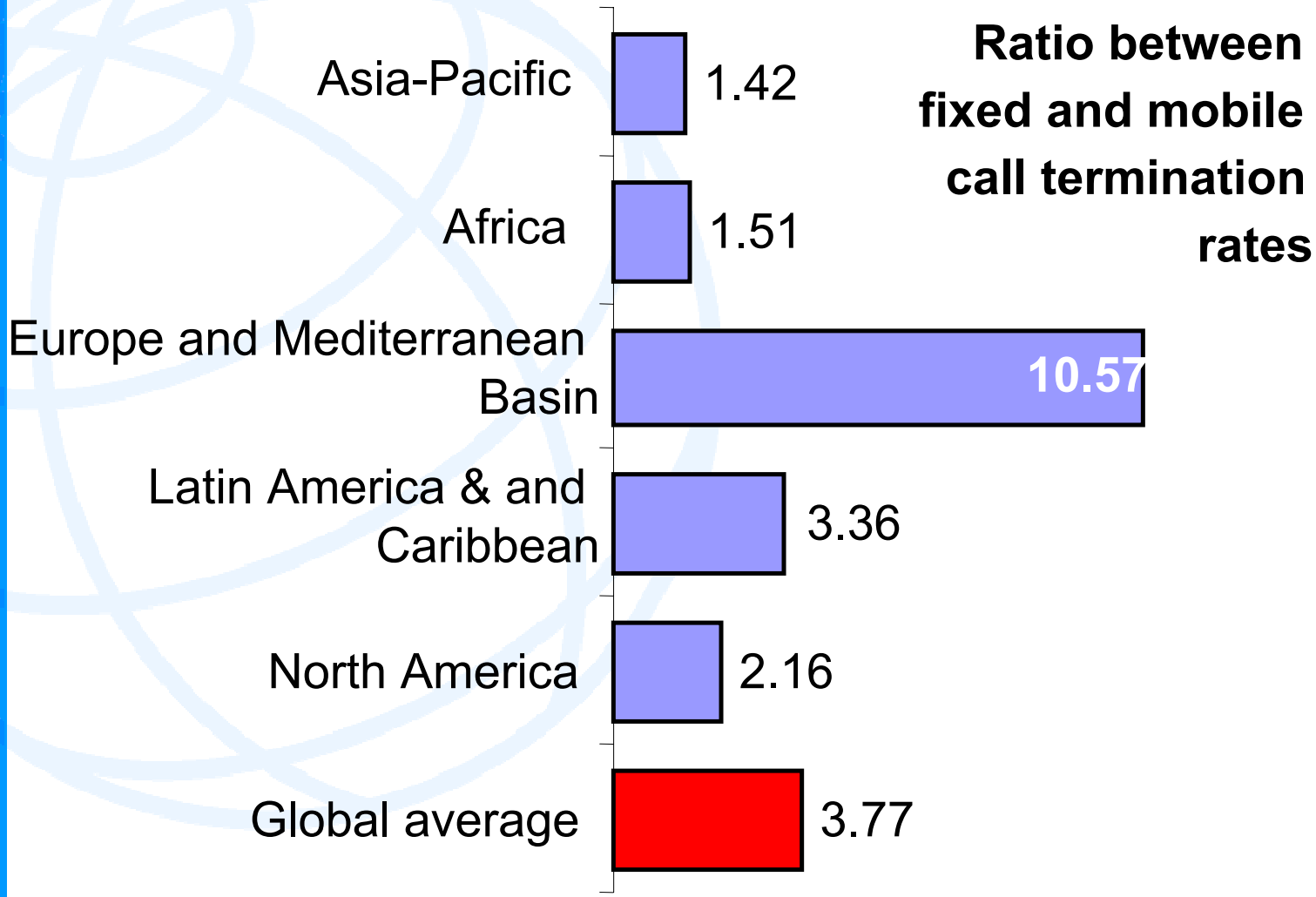
- **Towards complexity**
  - Differentiate between different traffic streams with different QoS
  - Differentiate between different user terminal devices (e.g., fixed, wireless, portable)
  - Provide interconnection options based on per-minute, per-volume, per-service type and per-content type
- **Towards simplicity**
  - Sender keeps all (bill and keep)
  - Arrangements based on interconnection capacity

Termination rates worldwide

Termination rates in US cents per minute	**Average fixed rate**	**Avererage mobile rate**
Asia-Pacific	11.69	16.58
Africa	13.62	20.57
Europe and Mediterreanean	3.11	32.86
Latin America and Caribbean	4.88	16.43
North America	2.81	6.07
Global average	**5.77**	**21.76**

Source: ITU-T, based on survey of regional tariff groups.

Spot the odd one out ….



Source: ITU-T, based on survey of regional tariff groups.

Conclusions

- Inter-operator settlements remain important (but become more complex) in a converged or NGN environment
- **Short-term:** Per-minute settlement is preferred choice for carriers, but hard to sustain. Rates are dropping.
- **Longer term:** shift towards capacity-based pricing and/or towards "Sender Keeps All"
- Trends toward bundling and flat-rate pricing in retail market will be mirrored by capacity-based pricing in wholesale market
- **But,** migration to NGN will not make concerns over Significant Market Power (SMP) disappear

Thank you.

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