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Trends and Hot Topics in Network Management

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Enterprise Management

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- **IT Management (1 staff member for300-1000)**

    Proprietary

    Secure

    Reliable

    Controlled Cost

- **DC Management (1 staff member for 30-300 users)**

    Protocol Oriented

    Unreliable

    SNMP Oriented

    Hidden Cost

- **Telco (Voice) Management (1 staff member for 500-1000 users)**

    Reliable

    Proprietary

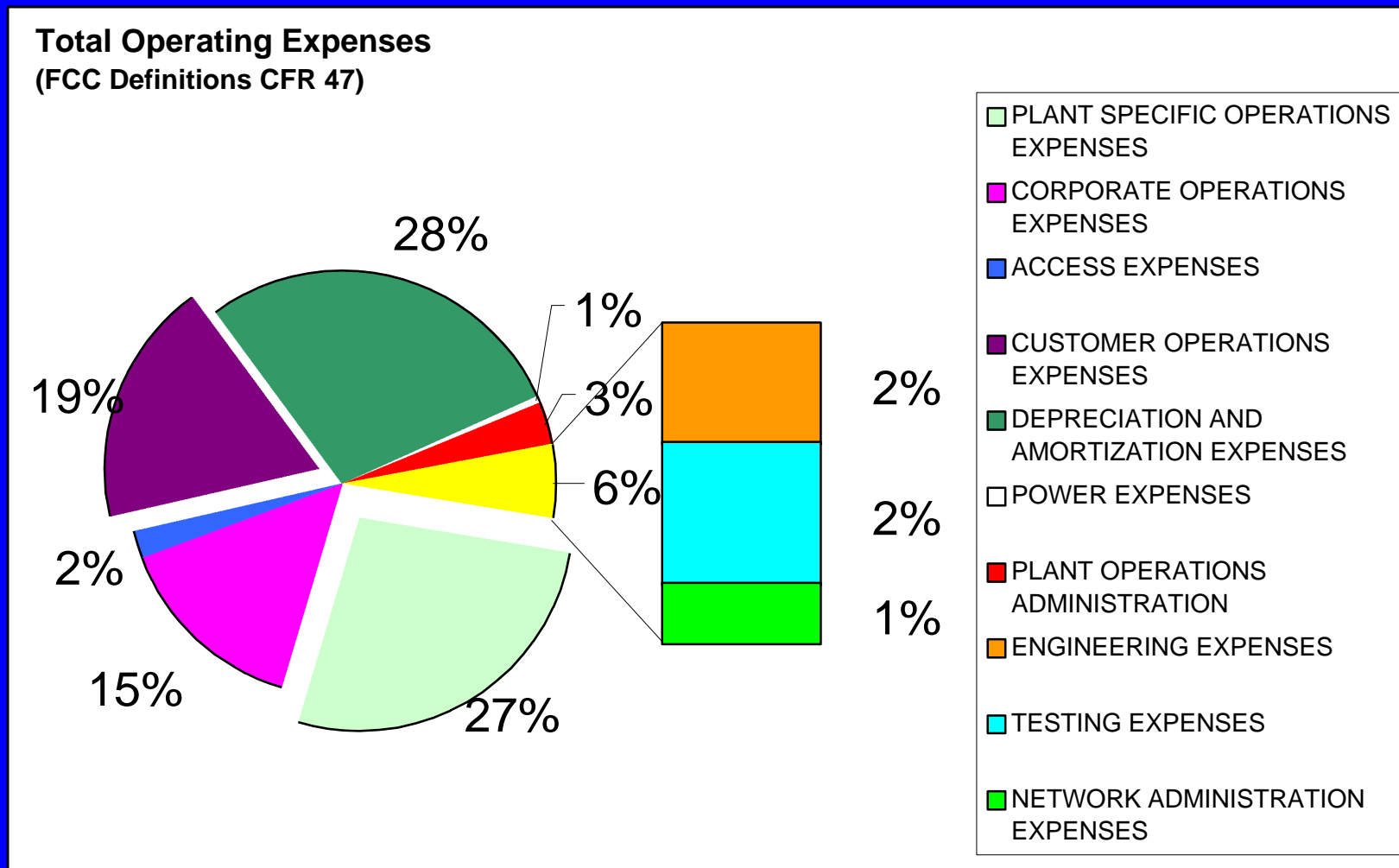   Free (Carrier's Mercy)

Evolution of IP Value

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Growth of Internet

- Regulation
- Academic

- PC Penetration
- Increased Business use
- Growing On-line services
- GUI based/browsers
- security

- Fast
- Cheap
- simple
- Ubiquitous

Research/Academic

Hobbyist/ Internal Business

Increased Consumer Use

Key Business Tool

Today

Time

National Science Foundation

- MCIWoRLDCOM
- Sprint
- AOL etc.

Infrastructure & Control

Academic → **Business** → **Consumer**

Information transfer (FTP) E-mail

+

Product catalogues

+

Electronic commerce
Entertainment
Infomercials

Focus

Telco Management

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Total Operating Expenses
(FCC Definitions CFR 47)

- ☐ PLANT SPECIFIC OPERATIONS EXPENSES
- ☐ CORPORATE OPERATIONS EXPENSES
- ☐ ACCESS EXPENSES
- ☐ CUSTOMER OPERATIONS EXPENSES
- ☐ DEPRECIATION AND AMORTIZATION EXPENSES
- ☐ POWER EXPENSES
- ☐ PLANT OPERATIONS ADMINISTRATION
- ☐ ENGINEERING EXPENSES
- ☐ TESTING EXPENSES
- ☐ NETWORK ADMINISTRATION EXPENSES

Antibes, July 2000

ISCC2000

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IP Service Provider Cost Breakdown

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$19.95 per month subscription

$7.50-$10.50 Wholesale PoP Access

$2.00 - $3.00 Customer Care

$3.50-$7.50 margin per customer

$3.00 amortized customer marketing

Source: Adapted from Paul Stapleton, ISP $ Market Report, Boardwatch Magazine.

Wholesale pricing: what's the difference?

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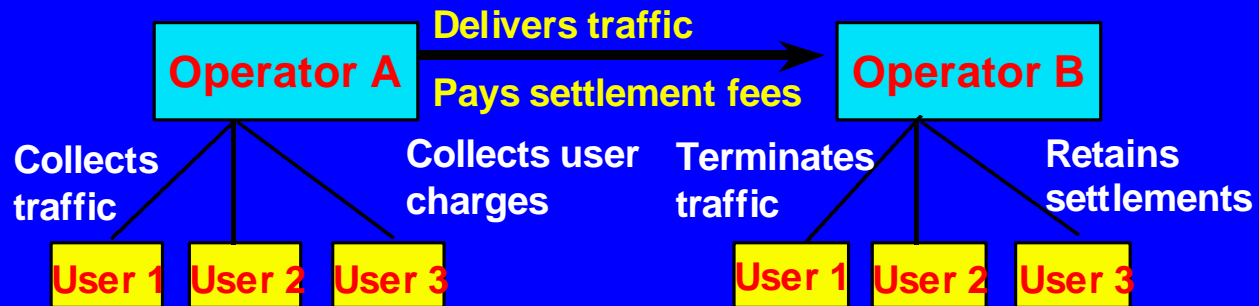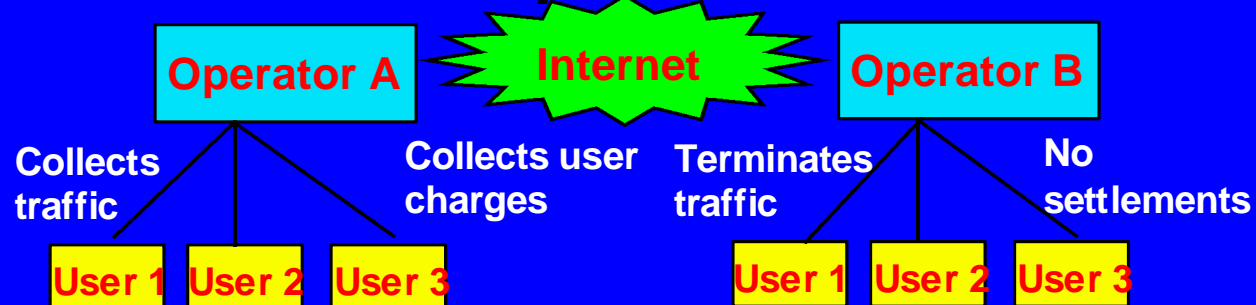
Settlement-payment traffic

Delivers traffic

| Operator A | → | Operator B |

Pays settlement fees

Collects traffic

Collects user charges

Terminates traffic

Retains settlements

| User 1 | User 2 | User 3 | | User 1 | User 2 | User 3 |

Sender-keeps-all traffic

| Operator A | ← Internet → | Operator B |

Collects traffic

Collects user charges

Terminates traffic

No settlements

| User 1 | User 2 | User 3 | | User 1 | User 2 | User 3 |

Balance of Internet traffic

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Asia-Pacific, 3.2%

Europe, 7.5%

Canada, 5.0%

Rest of world, 0.9%

United States, 83.4%

Note: Based on traffic monitored on NSFNet,
Source: ITU/TeleGeography "Direction of Traffic"

Wireless Evolution

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Legend
Japan-Digital
US-Digital
GSM
Analogue

Percentages (right axis): 8 %, 29 %, 51 %, 12 %

Years (x-axis): 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002

Y-axis values: 0, 50', 100', 150', 200', 250', 300', 350', 400', 450'
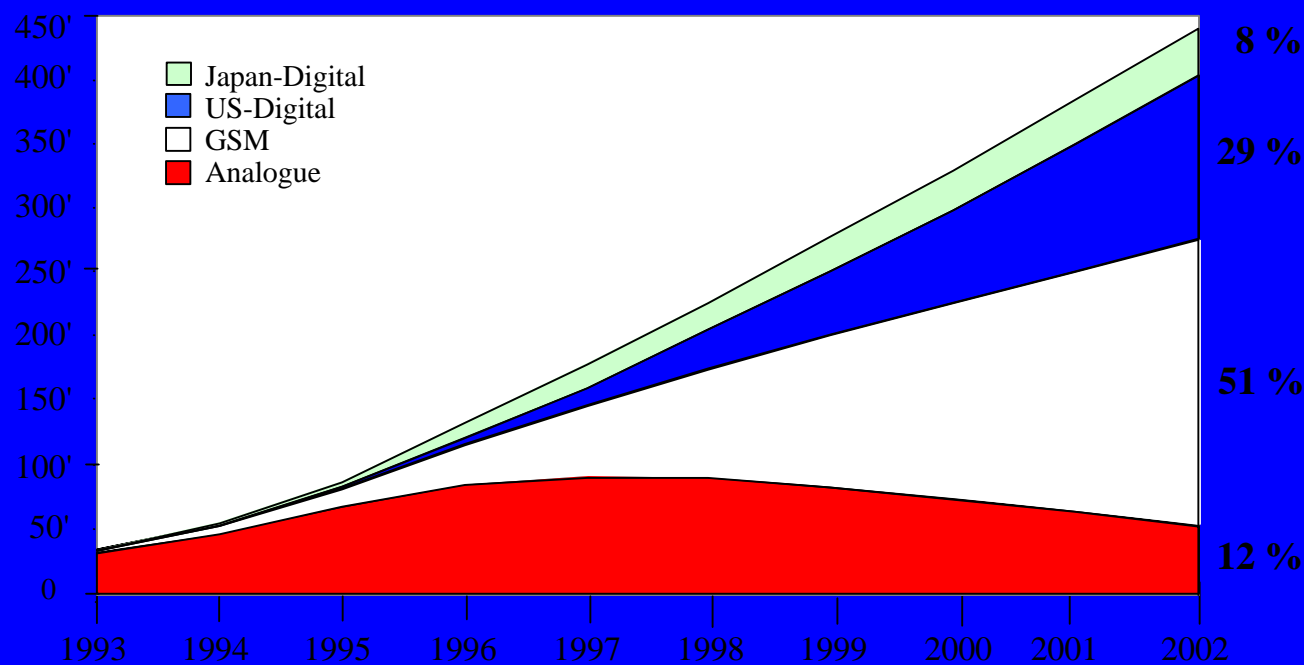
1G
Main driver: Mobile
Traffic: voice
Competition: Limited
Cost: Prohibitive
Penetration: Niche Users

2G
Main driver: spectrum and cost reduction through digital
Traffic: voice+data
Competition: Increasing
Cost: Affordable
Penetration: Mass Market

3G
Main driver: Internet+spectrum
Traffic: Applications+Data+voice
Competition: High+Contents
Cost: no barrier
Penetration: everyone

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3G.IP

OHG

(Operator Harmonization Group)

Created

G3G (Global 3 G)

3G Specifications

**3GPP2
TSG-S WG2**

Cooperate
under TIA Charter

TIA TR45.7

2G+ Specifications (IS-4108)

Cooperate
under ANSI Charter

T1M1.5

Cooperation
Initiated

Submit US
Position to ITU-T

Top Down approach

TMF

**3GPP
TSG-SA WG5 TM**

**ITU-T IMT2000
JQG6 (SG4/SG11)**

IETF

Submit EU
Position to ITU-T

ETSI

M.3210.imt

3G Wireless Challenges

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Other
Networks

Satellite
Networks

Mobile
Networks

Satellite

Wireless Network

BTS

Terrestrial

PSTN, ISDN, Internet
Data Networks, Private
Networks,

Air Interface:

- **In-building 2 Mb/s**
- **Neighborhood**
  - **Mobile – 384 kbps**
  - **Fixed – 2 Mb/s**
- **Wide-area 144 Kb/s**

- **Varying degrees of mobility**
- **Significant data rates**
- **Many interfaces**

Thank You

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