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Mobilizing the Internet

Jon Shantz

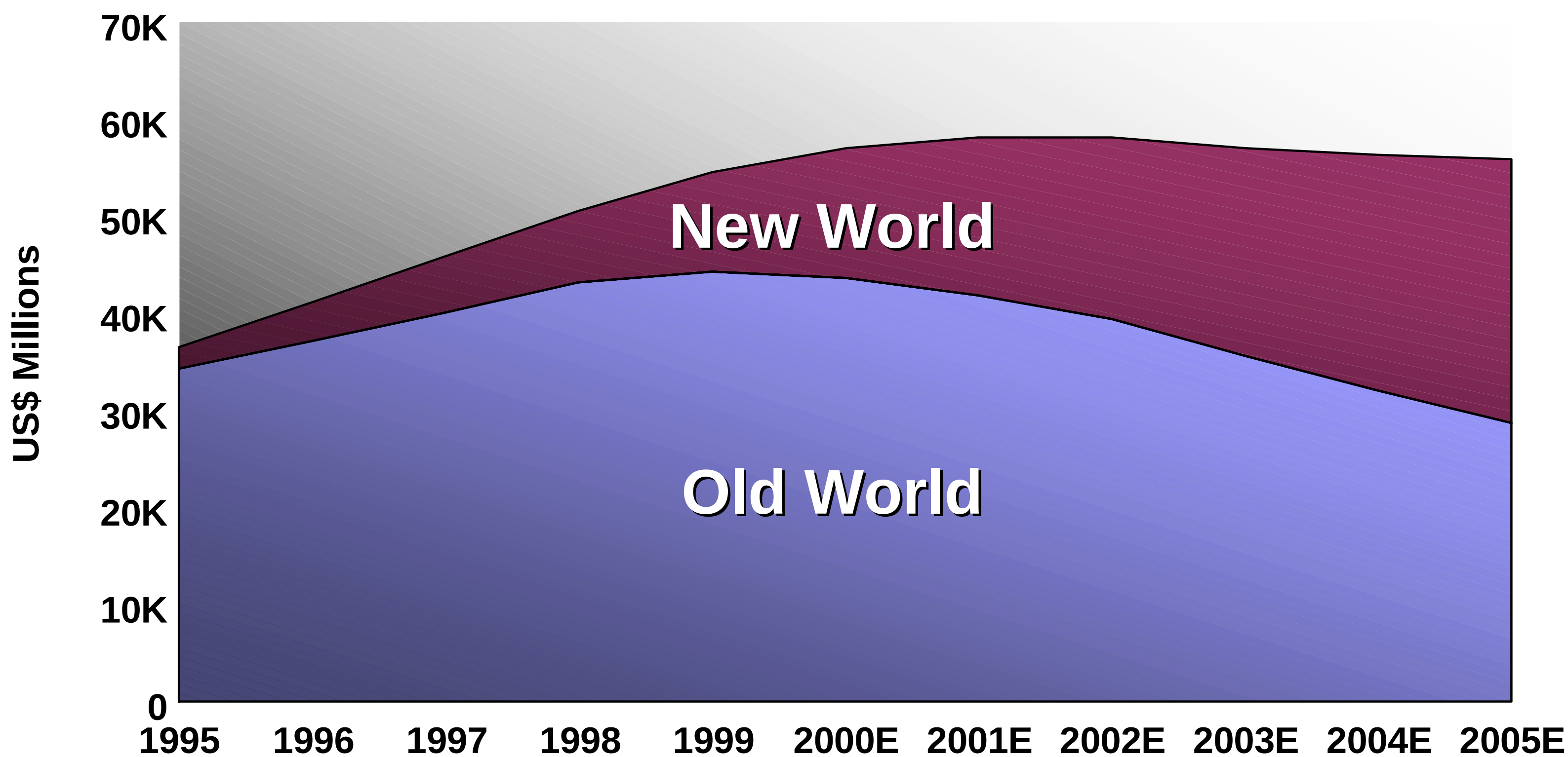
VP Market Development,
Cisco Systems

An Epic Time of Change

- TDM to Packets
- Facilities to Content
- Vertical to Horizontal
- Enterprise IT to Network Applications
- Cheap Bandwidth
- Network Intelligence
- Web-based Infrastructure
- Mobile Market is Next

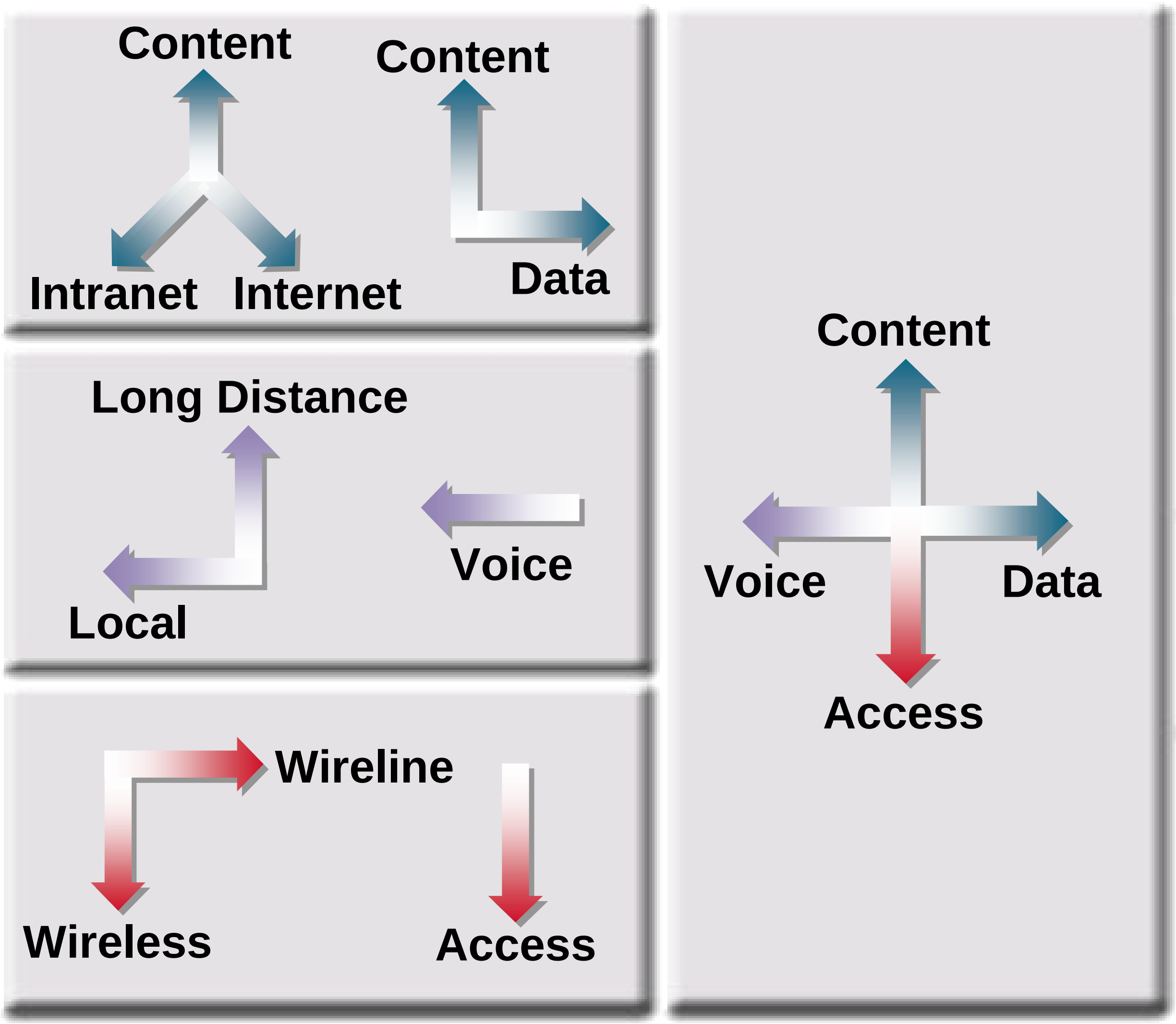
Global Switching/Routing Expenditures

Old World Vs. New World



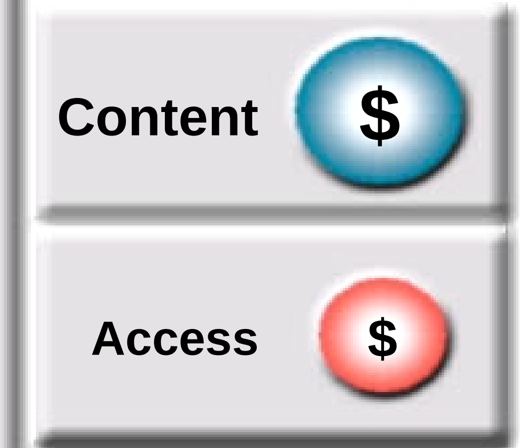
Source: Probe Research, September 1999

Evolving Market Focus

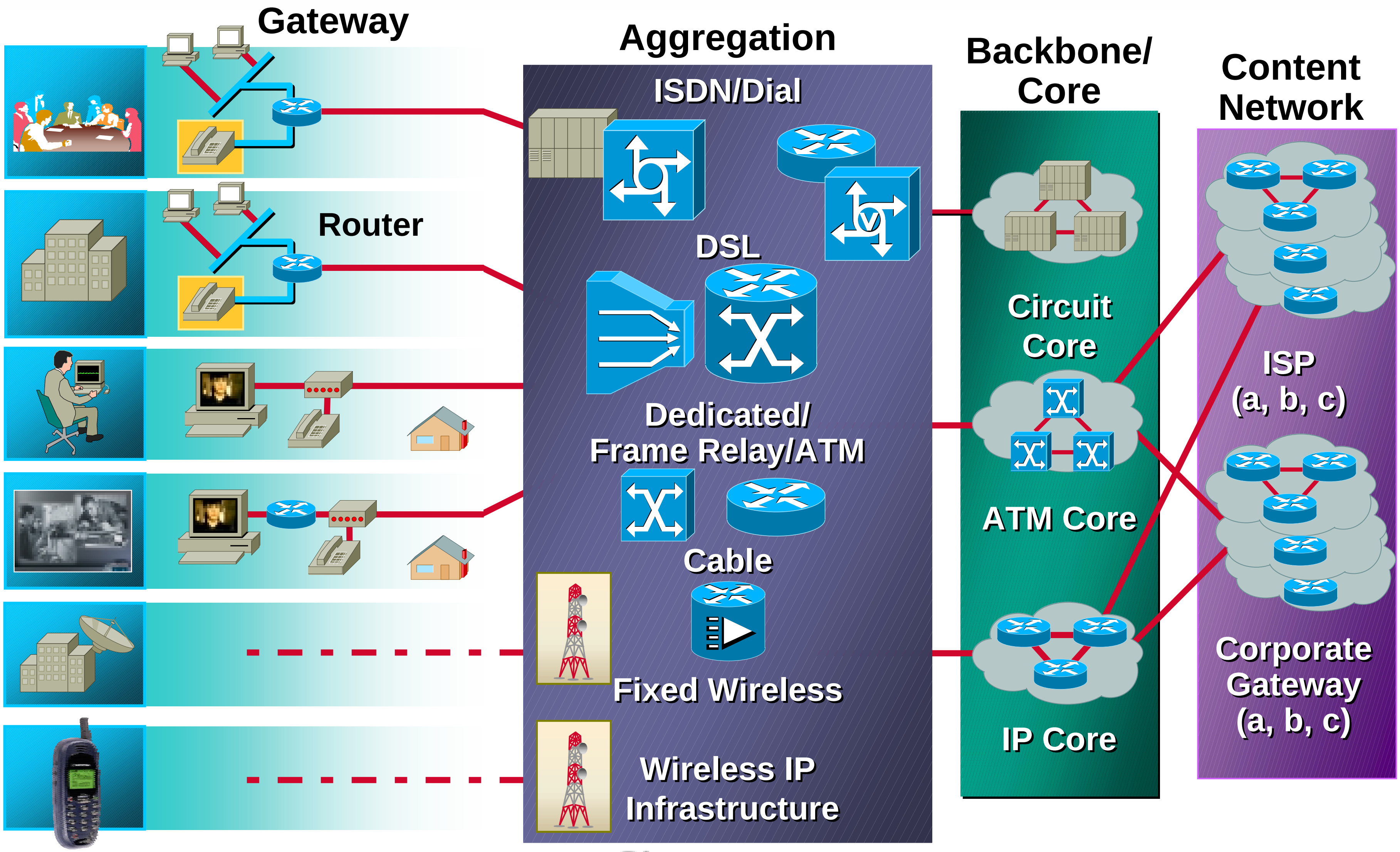


Dynamics

- Competition, deregulation, consolidation
- Internet acceleration
- Voice revenue pressure
- Market transition from push to pull



New World Service Provider Architecture



Wireless Transition from Voice to Data Driven Market

Mobile Wireless and the Internet

- Mobile access will extend Internet reach
- Mobility will drive new applications and services
- By 2003*, more mobile terminals will access the Internet than PCs

	PC	Cable	Mobile
1998	298M	199M	290M
2003	550M	260M	1300M

More than 600M Mobile Data Subscribers by 2003

Source: Dataquest/ Gartner Group

Wireless ➡ Data Driven

- **Substitutability & competition in wireless voice**
- **Bundling of voice services - long dist, mobile, etc**

voice commoditization

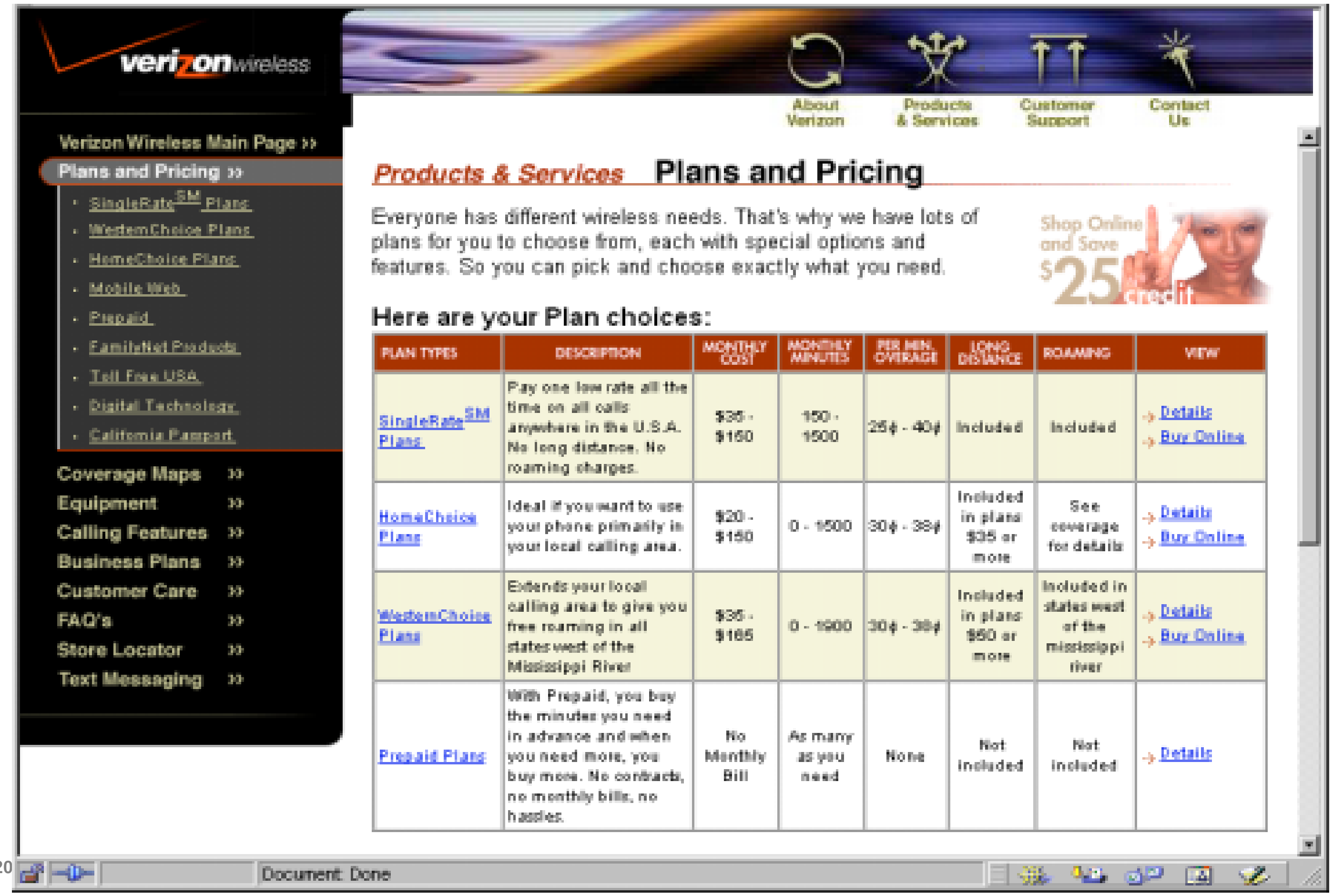
- **Data provides platform for new services**
- **Data provides differentiation and “stickiness”**

data differentiation

- **Data services infrastructure build out has already started**

Bundling of Long Distance and Mobile Voice Services

Value Proposition = 1500 Min Mobile + Free Long Distance



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Everyone has different wireless needs. That's why we have lots of plans for you to choose from, each with special options and features. So you can pick and choose exactly what you need.

Shop Online and Save $25 credit

Here are your Plan choices:

PLAN TYPES	DESCRIPTION	MONTHLY COST	MONTHLY MINUTES	PER MIN. OVERAGE	LONG DISTANCE	ROAMING	VIEW
SingleRate SM Plans	Pay one low rate all the time on all calls anywhere in the U.S.A. No long distance. No roaming charges.	$35 - $150	150 - 1500	25¢ - 40¢	Included	Included	Details Buy Online
HomeChoice Plans	Ideal if you want to use your phone primarily in your local calling area.	$20 - $150	0 - 1500	30¢ - 38¢	Included in plans $35 or more	See coverage for details	Details Buy Online
WesternChoice Plans	Extends your local calling area to give you free roaming in all states west of the Mississippi River	$35 - $165	0 - 1900	30¢ - 38¢	Included in plans $50 or more	Included in states west of the mississippi river	Details Buy Online
Prepaid Plans	With Prepaid, you buy the minutes you need in advance and when you need more, you buy more. No contracts, no monthly bills, no hassles.	No Monthly Bill	As many as you need	None	Not included	Not included	Details

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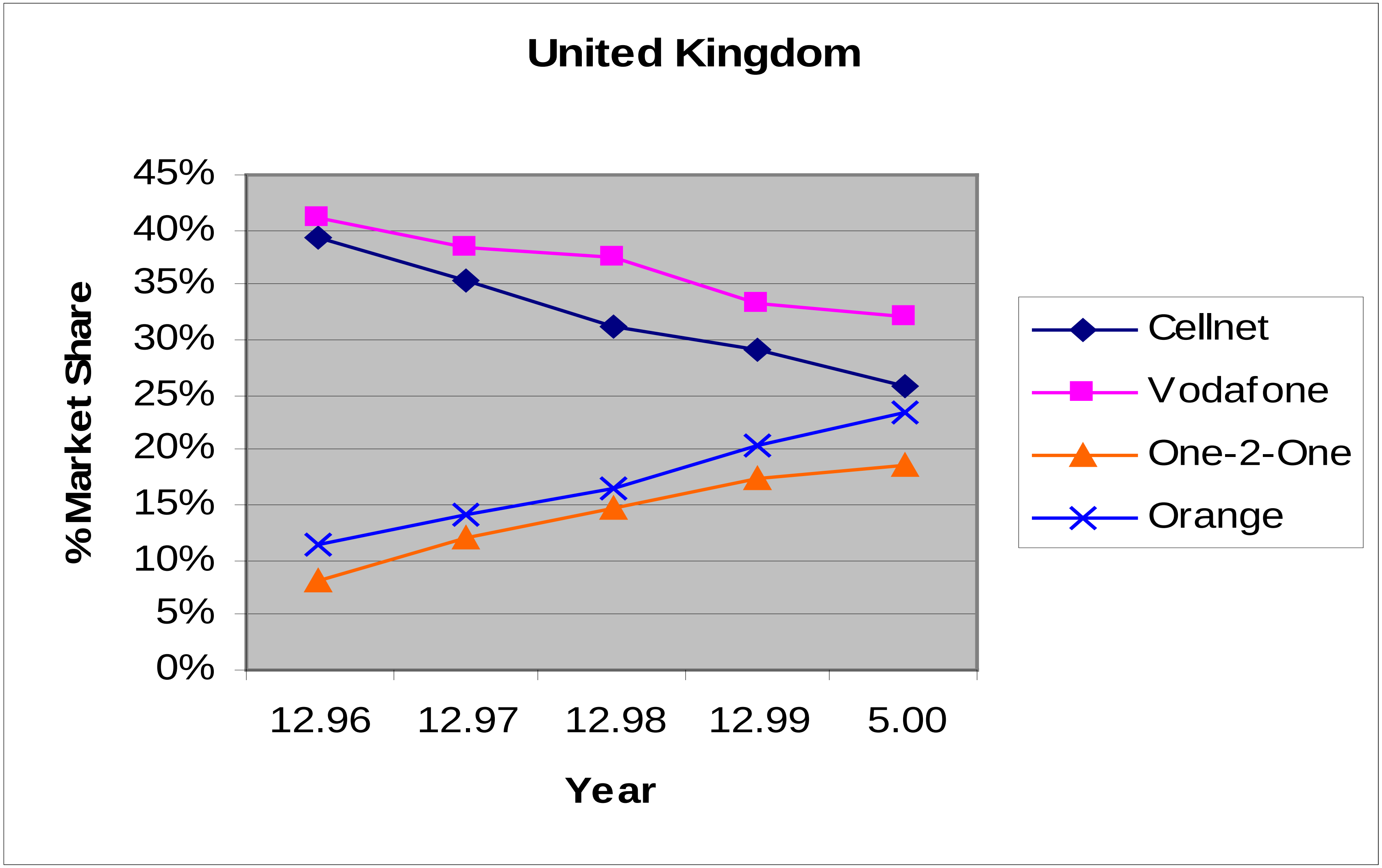
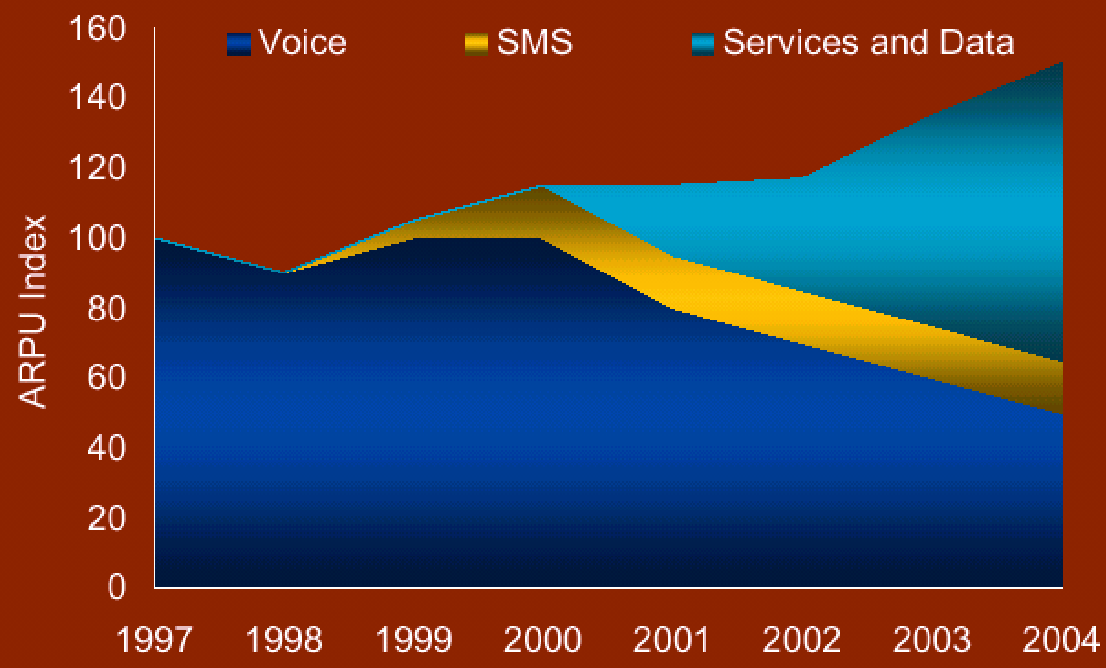
Substitutability of Voice Service



Sonera's View

Changing Earnings Logic in Wireless



- New revenue streams
- Higher ARPU, but more fragmented
- Price pressure
- Flattening sub growth

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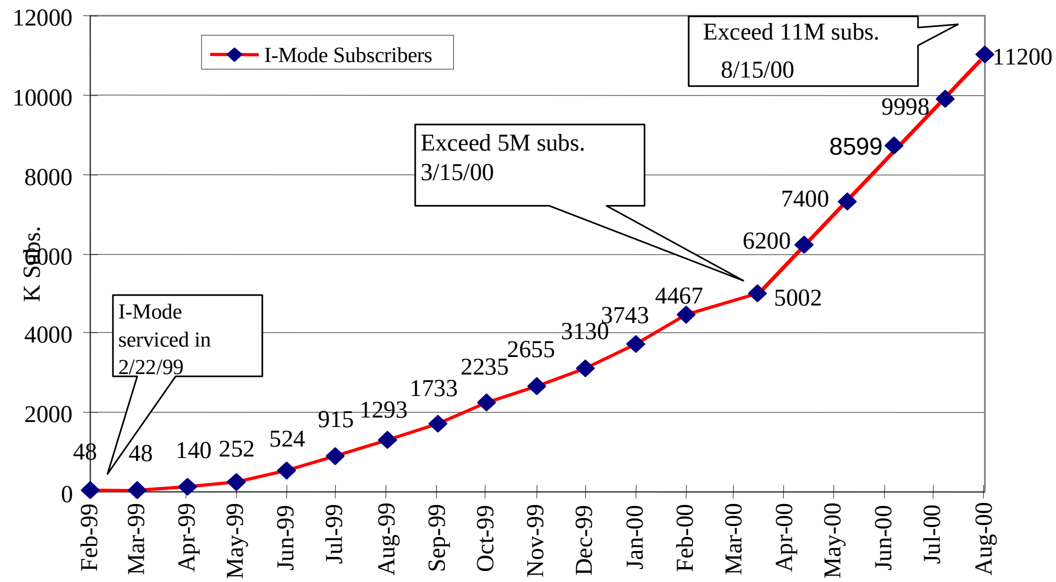
Internet Connection Statistics

- NTT DoCoMo's i-Mode subscribers exceed 11M.
- Subscribers to the KDDI EZWeb connection service topped 3.5M.
- The number of subscribers of J-Phone group's 'J-Sky' Internet services exceeded 2.7M.

NTT DoCoMo i-Mode Subscriber Growth



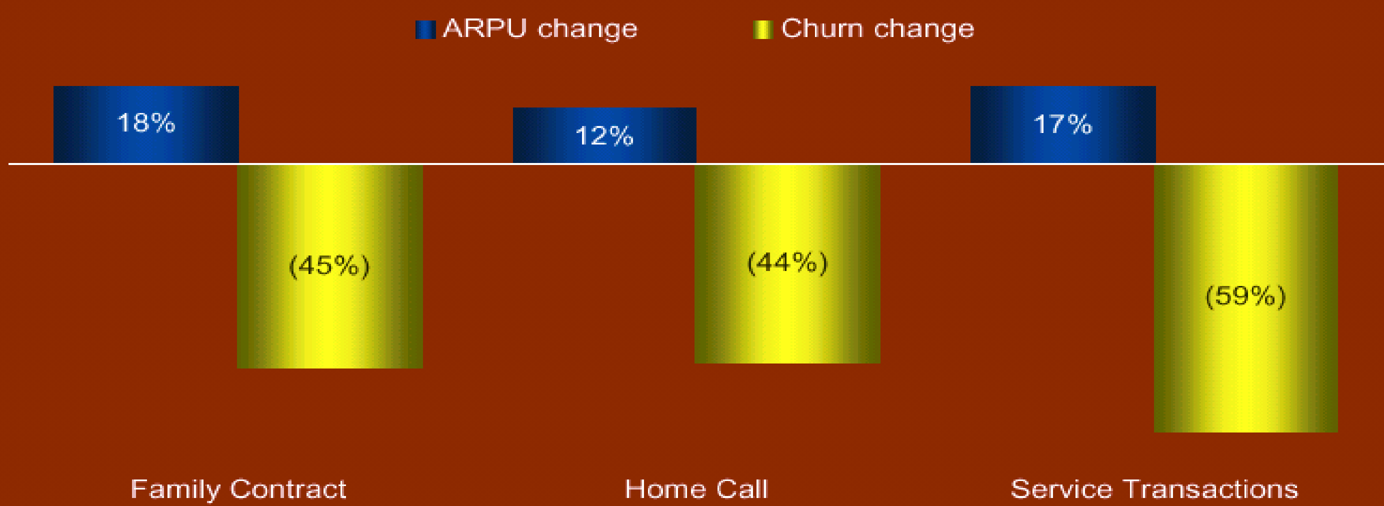
Source: NTT DoCoMo Press Release

Impact of Data & Messaging - Sonera

Improved Customer Retention

H1/2000

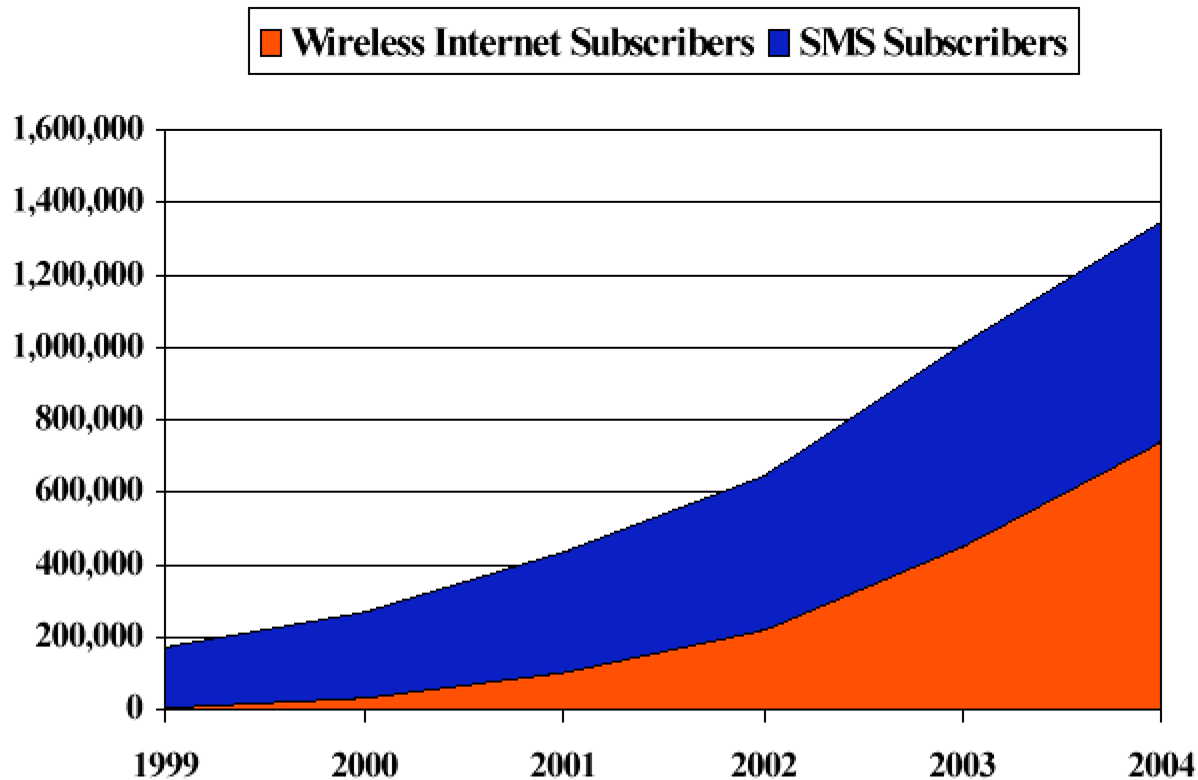
Sonera has been fostering demand and customer loyalty through targeted segmentation



Growth At Internet Rates
SMS Rapid Growth - 8B msgs/month

Total UK SMS sent during July rose almost 600% year-on-year, up from 74M to 516M

Source: Global Mobile Daily, Sept 2000



Source: Cahners In-Stat Group

Current Mobile Infrastructure Not Well Suited for Data

- **SMS growth driving switch purchases**
- **Circuit switched data**
  - **Low throughput**
  - **Long hold times**

Wireline went through this three years ago

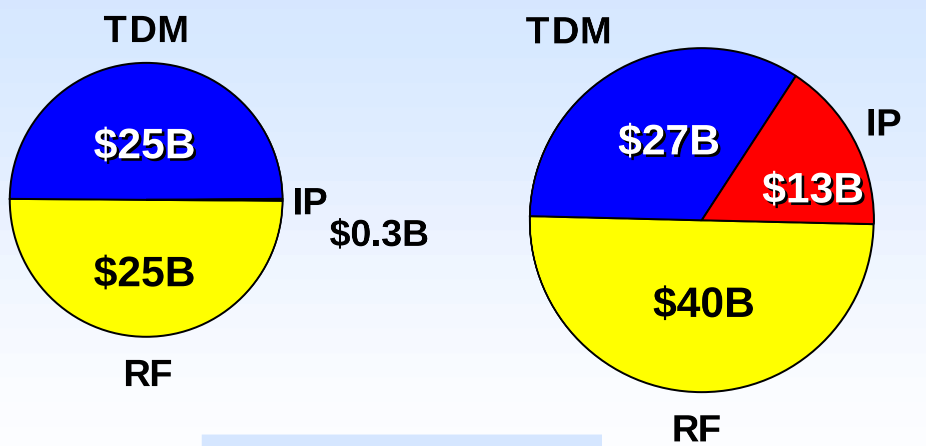
Cisco Mobile Wireless Focus

Mobile Wireless Insertion Strategy

Infrastructure Spending

Year 2000 -- $50B

Year 2004 -- $80B



CAGR = 13%

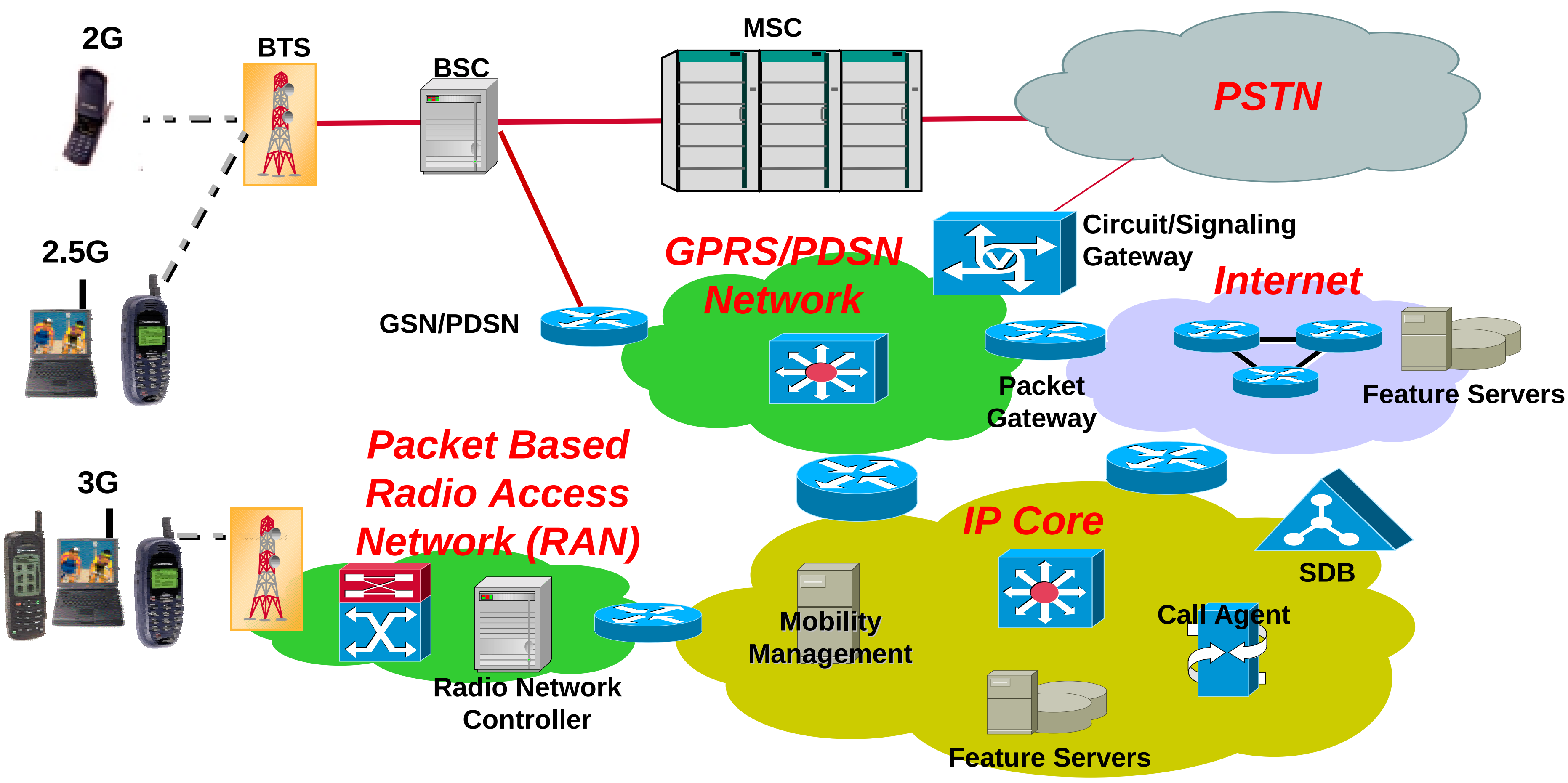
Growth and Margins

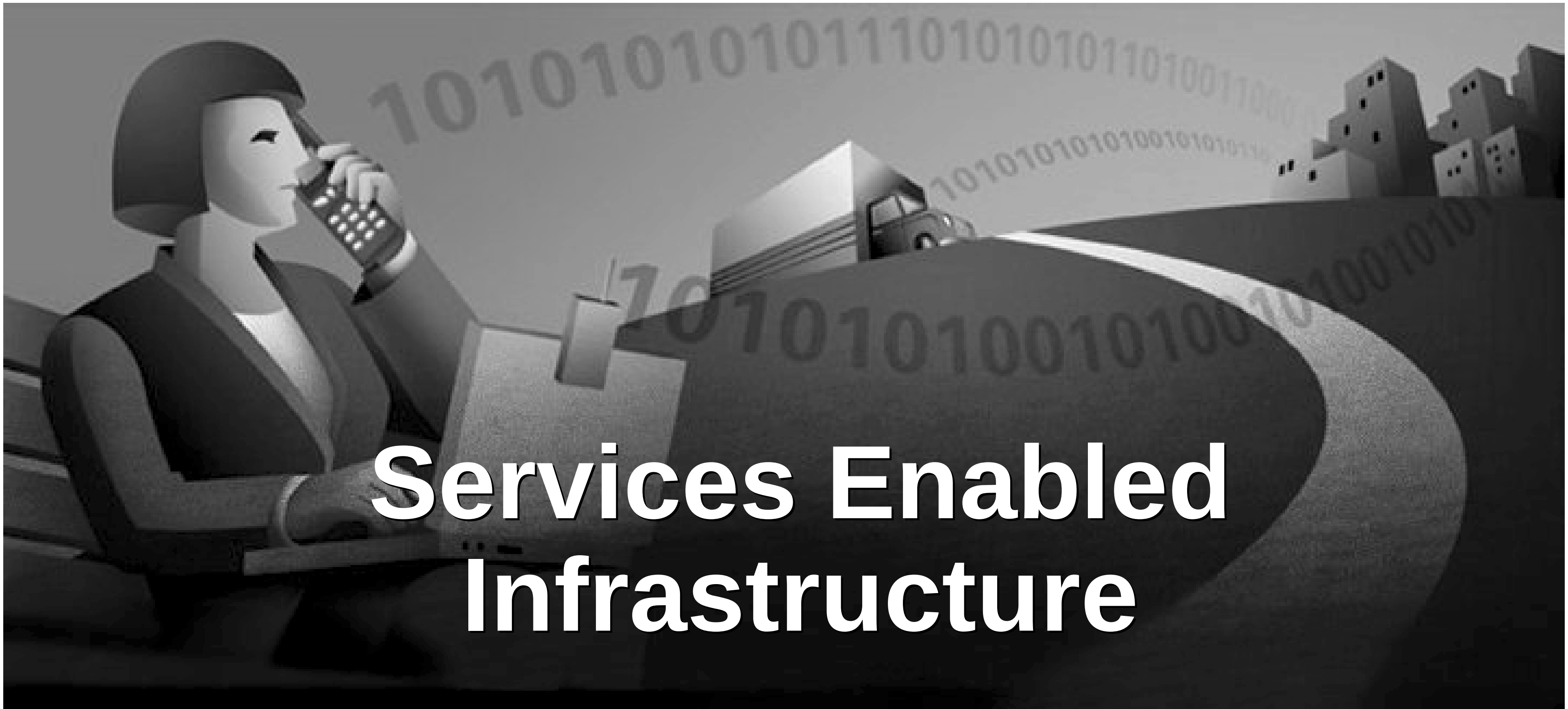
	Revenue Annual Growth	Gross Margins
RF	13%	30%
TDM	2%	50%
IP	185%	60%

Focus on IP and Mobilizing Internet

Source: Cisco analysis of multiple industry sources

One Packet Infrastructure—Same Services as 2.5/3G





Services Enabled Infrastructure

Typical User Segmentation

Techie

End User Experience
- Primary use is PDA, PC - not phone
- Internet Access
- Integrated email/vmail
- Common wireline/wireless experience

Social

End User Experience
- Ease of use - one button functions
- Information services
- Walled garden

Empowered

End User Experience
- Information Services
- Integrated Messaging
- Personalized Access to Services
- Access to business partners

Business

End User Experience
- Corporate Applications - VPNs and security
- Consistent access via different media
- Immediate Availability of Services - performance
- Email/vmail integrated with company

Youth/Kids

End User Experience
- Instant Messaging
- Chat/ Groups
- Internet and Games

Implications for Network Services

- Internet Access
- Public/Private Addressing
- Corporate Policies and Security
- Policy and Control
- Streaming, multicast, etc
- Content Distribution and Mgmt
- Virtual Private Nets
- Unified Messaging
- Enterprise Content Hosting
- Enterprise WAP servers
- Common Wireline/Wireless access policies
- Cross Domain Authentication

Techie Experience

- Primary use is PDA, PC - not phone
- Internet Access
- Integrated email/vmail
- Common wireline/wireless experience

Social Experience

- Ease of use - one button functions
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Youth/Kids Experience

- Instant Messaging
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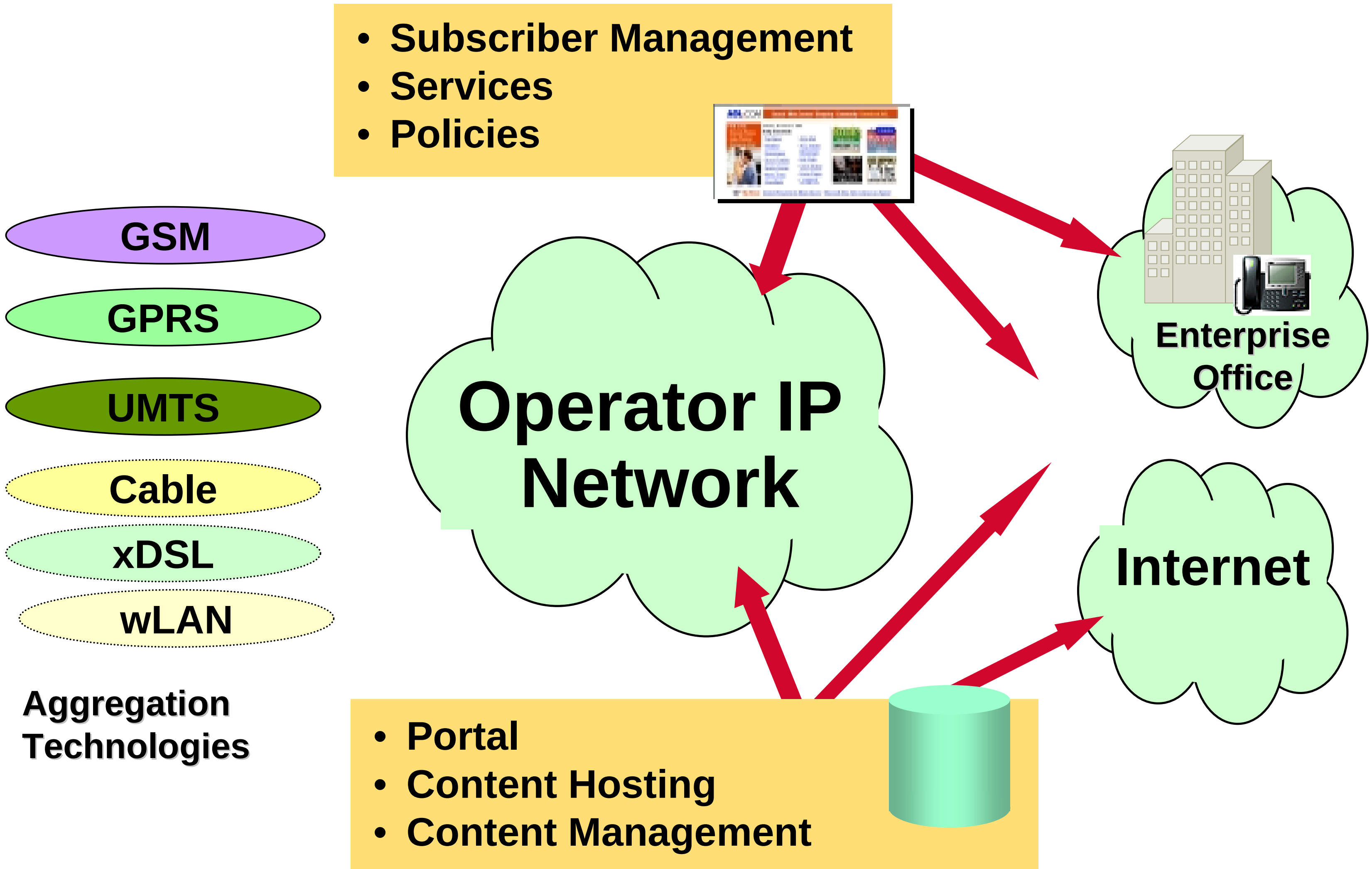
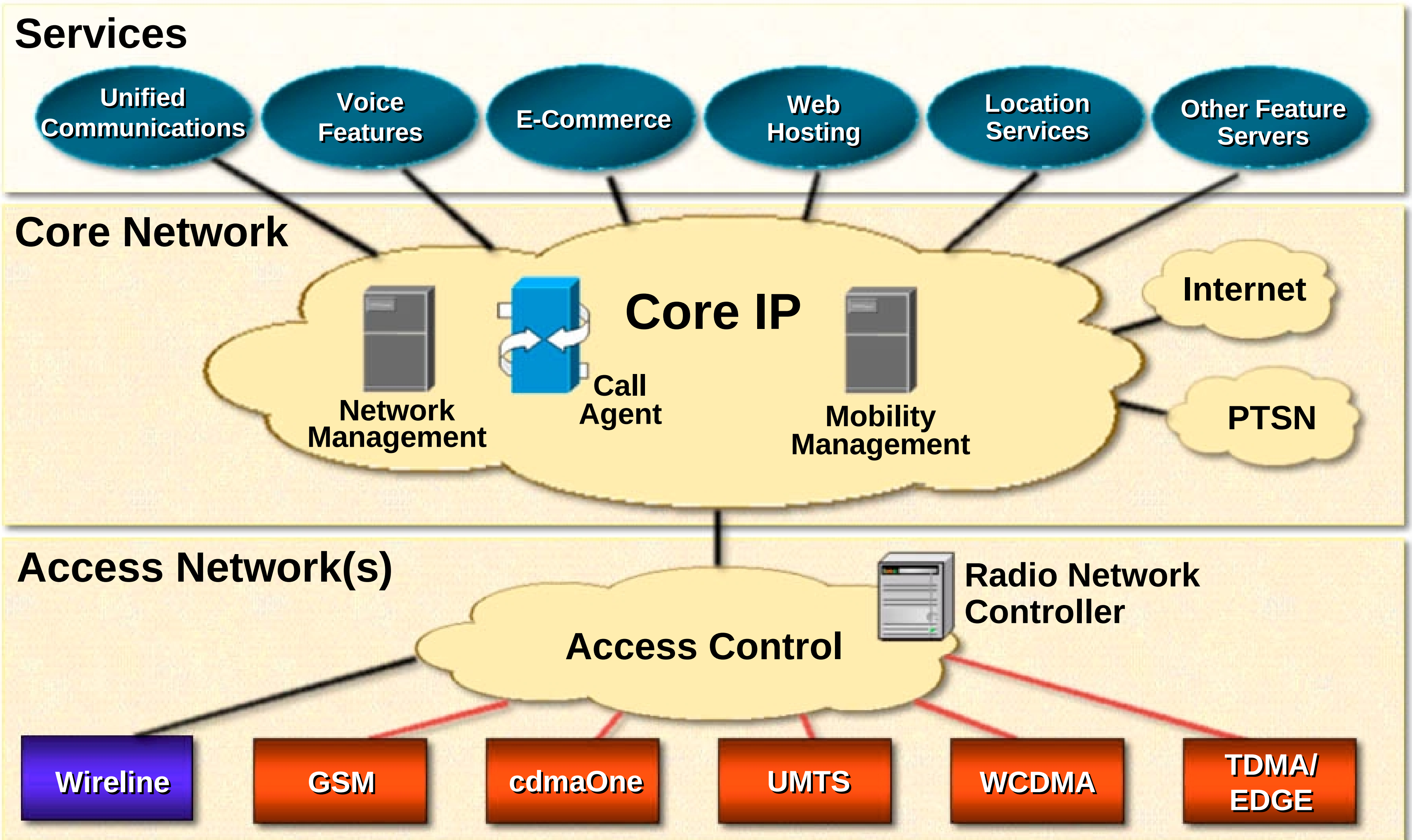
Plan for Multi-Domain Environment



Inflection Point for Wireless Industry

Open Architecture
Horizontal Market Structure

Common IP Architecture



End of Vertical Integration

- **Operators looking for best-of-breed subsystems**
- **Network architectures and tenders define subsystems and open interfaces**
  - –RAN
  - –Core
  - –Control network
  - –Internet
  - –Services platforms
  - –Switch/MSC
- **Operators desire primary supplier/integrator**

Vertical Integration Strategies?

System Suppliers	Terminals	RAN	IP Core	Internet
ERICSSON	Y	Y	Mostly Partnering	Mostly Partnering
Lucent Technologies		Y	Y	Mostly Partnering
NORTEL NETWORKS		Y	Mostly Partnering	Mostly Partnering
SIEMENS	Y		Partners	Partners
ALCATEL	Y		Partners	Partners

Open Ecosystem

System Suppliers	Terminals	RAN	IP Core	Internet
Cisco Systems — Empowering the Internet Generation		ATM/IP	# 1	# 1
Motorola	# 2	Y	Cisco and Partners	Mostly Cisco
Nokia — Connecting People	# 1	Y	Cisco and Partners	Mostly Cisco

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Wireless Alliances

Strategic - Systems, Development & Delivery

MOTOROLA

Solutions

NOKIA
CONNECTING PEOPLE

Technology

QUALCOMM
ALCATEL

Distribution

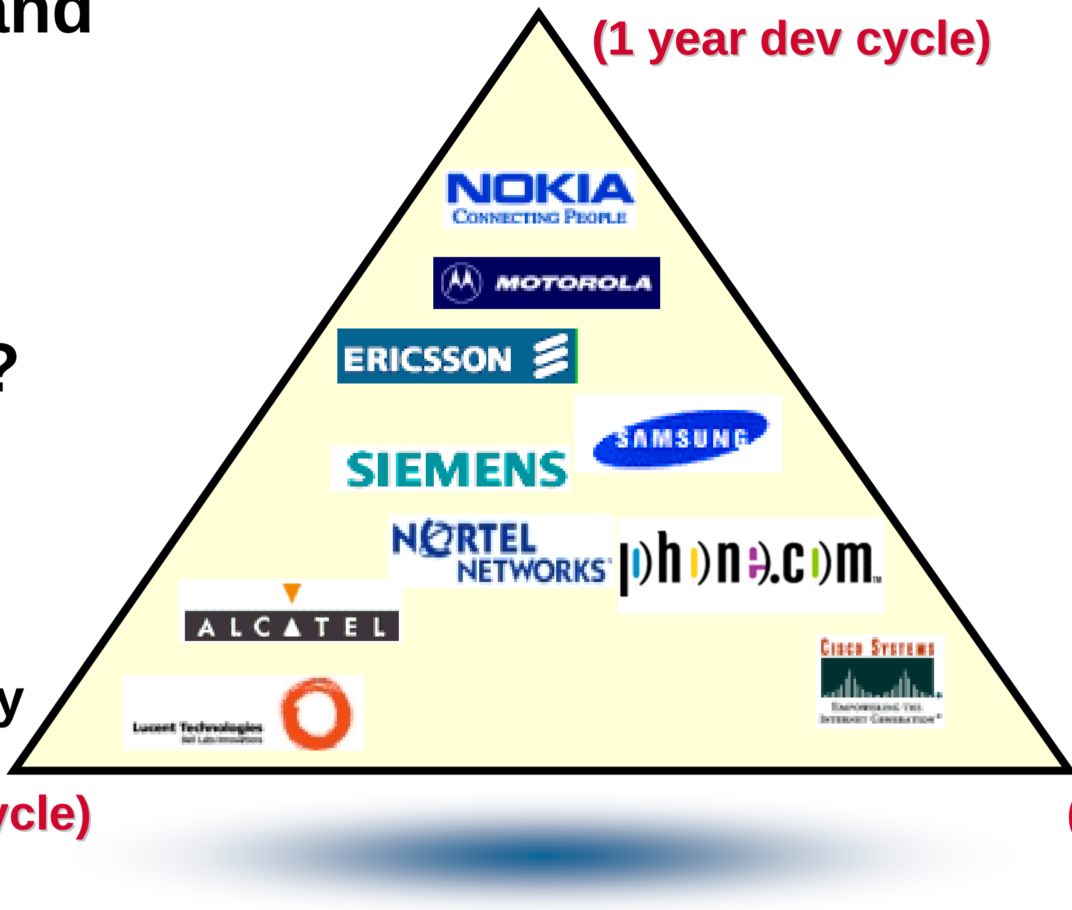
ERICSSON
SIEMENS
NEC
SAMSUNG

- **Multiple sources of solution**
- **Multi-faceted relationships**
- **Continuing investment in Alliances**

Value Contribution

- **Balance of services and control?**
- **Market Enabling Alliances?**

Handsets
(1 year dev cycle)



Telephony Services
(3 year dev cycle)

Internet Services
(3–6 month dev cycle)

Mobile Results

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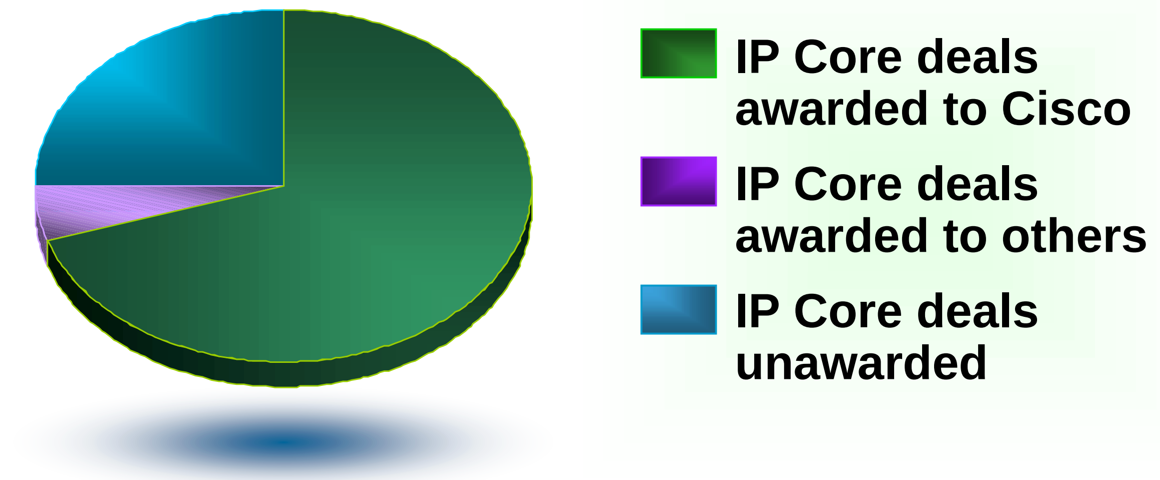
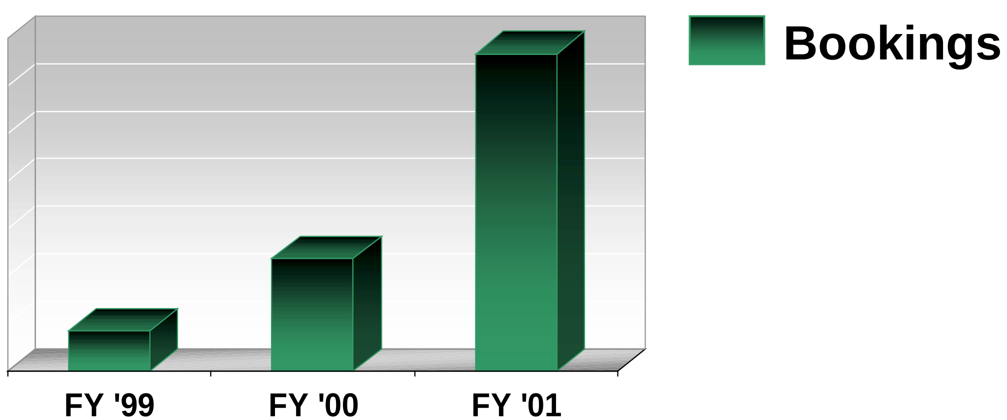
Top 20 EMEA Wireless Operator Penetration

IP Franchises in the Top 20 Operators in EMEA



Cisco Revenue in Global Mobile Operators



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Success Factors in the 3G Era

Key success factors pre-date 3G rollout

- Establish transport data service offering - 2.5 G
- Establish enterprise service offering
- Leverage Internet
  - Supplementary content
  - Time to market value add services
- Build subscriber value
  - Personalization capabilities
  - Web based customer service approach
  - Controllable services e.g. unified messaging

Summary

Summary

- Mobile market will be the next market to convert
- Market Inflection Point - Mobile Data
- Build data services offerings now - 3G investment
- Cisco is well positioned to lead the data services investment in mobile

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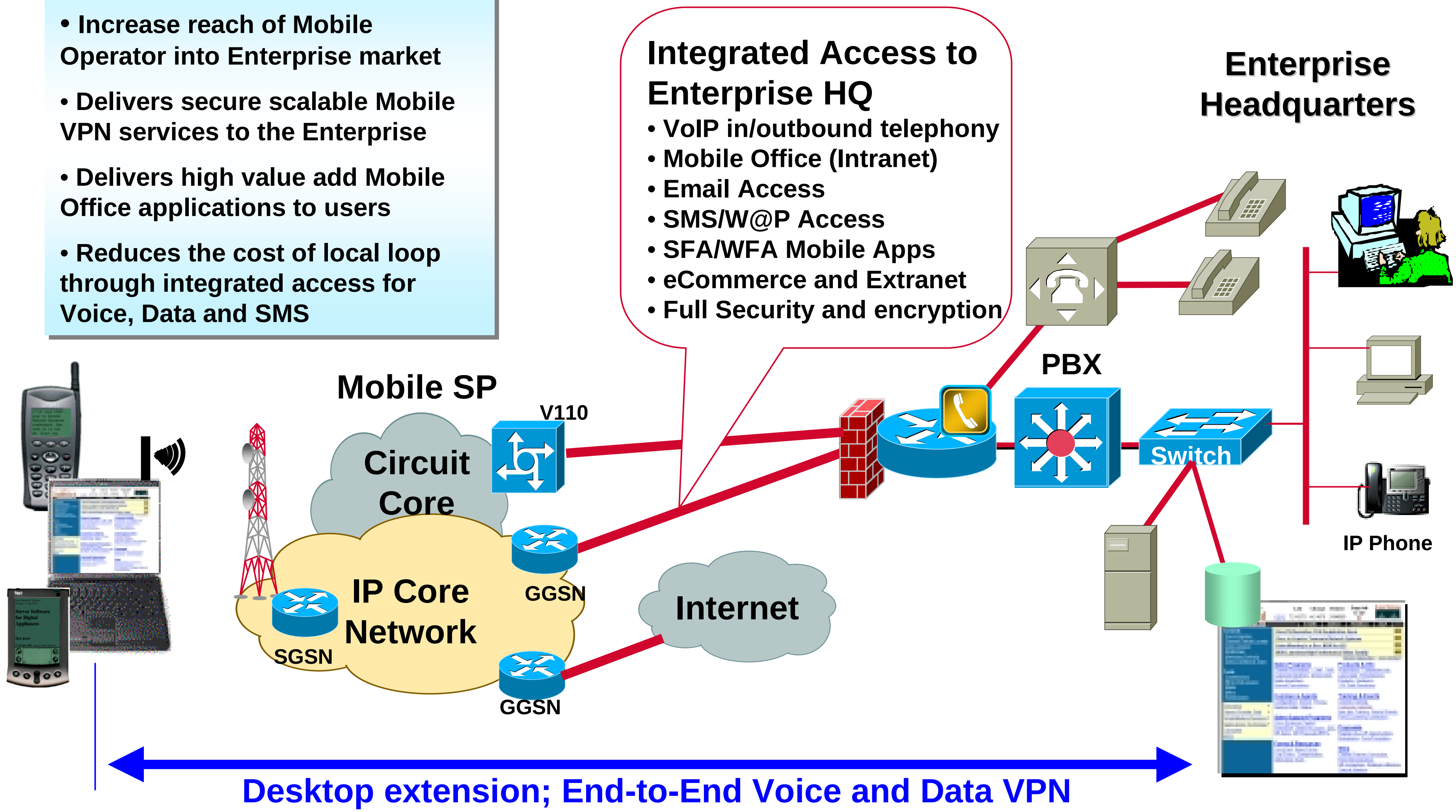
Extension VPN Integrated Access

Key Benefits:

- Increase reach of Mobile Operator into Enterprise market
- Delivers secure scalable Mobile VPN services to the Enterprise
- Delivers high value add Mobile Office applications to users
- Reduces the cost of local loop through integrated access for Voice, Data and SMS



Core Network Services Infrastructure of the Future