



## Mobile Market Overview

### Cisco Perspective

May 28, 2002



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**Discover**  
**All** That's **Possible**  
On The **Internet**

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## Cisco's Mobile Vision

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*The **Mobile Internet** is a service-rich environment that delivers voice, video and data services to the user across **any access medium**.*

*The Mobile Internet is your **personal assistant**. It understands who you are, where you are, and what you are trying to do. It delivers your services to you, rather than you going to find them.*

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## Mobile Wireless Overview - Agenda

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- **Current Mobile Market Dynamics**
- **Services – a key Revenue Driver**
- **Cisco – Your Mobile Partner**
- **Final thoughts**

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## Worldwide Mobile Service Provider Business Climate

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## WW Mobile Service Provider Business Climate

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	Voice Status	Data usage	CY02 Focus
NA	Moderate Penetration	1~2 % of ARPU	TDMA/GSM Migration Capacity Expansion 2.5 G Upgrade
EMEA	Very High Penetration	SMS 4~15 % ARPU Upgraded to 2.5G	GPRS / MMS Enterprise Market 3G Build out Voice Capacity
JAPAN	Moderate Penetration	Strong Lead in Data I-Mode 18% ARPU	3G Rollout Enterprise Market
APAC	High Penetration	SMS 4~15 % ARPU Upgraded to 2.5G	GPRS / MMS Enterprise Market
China	Low Penetration	Very Low	Network Build up Capacity Expansion

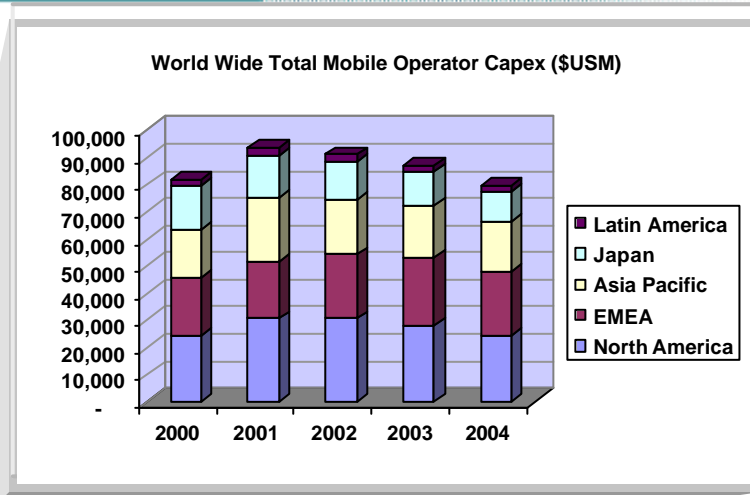
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## World Wide Summary of Top Down Analysis of Mobile Operator Total Capex - Graph

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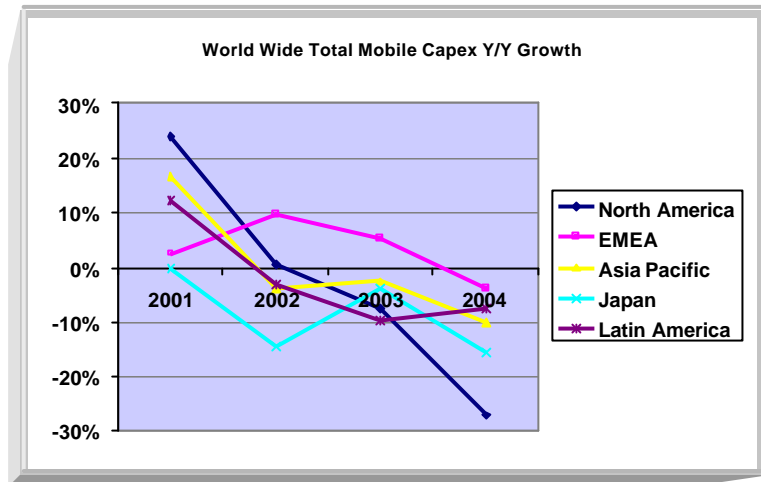
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## World Wide Top Down Analysis of Mobile Operator Total Capex Year/Year Growth

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## Market View

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- Success in 3G will be predicated on execution in 2.5G  
Data services – Data services are the same in 2.5G as in 3G
- Market inflection point is **data services** – not the introduction of 3G radios
- Enterprise adoption can lead the services introduction
- 3G will not happen as soon as people hope and therefore services adoption and revenue will lag (service in 2004)
- Will be an increasing adoption of horizontal network architectures, procurement behaviors and business models

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## Global Trends

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### Europe

- GPRS is NOW commercially available for business users (another 6 months for consumers)
- MO are selecting a small number of “strategic suppliers”
- SMS is contributing 12.5% of revenues in 2001....By 2004 Operators claim that 25% of Revenue will come from DATA
- Latest market factor is MMS services – just being launched: TIM, Vodafone

### USA

- Churn rates are increasing 2.8%/mo
- ARPU remains steady
- Data services just beginning to launch
- Messaging standards and access becoming an important political issue (AOL, MSFT vs MO)

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## Global Trends Asia Pac and Japan

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### China

- Subscribers 131M growing at 75% Y/Y growth, penetration rate at 10%
- ARPU margins are at 56% (2<sup>nd</sup> highest) due to low 0.9% churn rate (lowest)

### Korea

- Margins are 45% - some of highest globally
- Data generating 5% of service revenues and will grow 60% CAGR until 2006.
- Explosion of SMS traffic due to interoperable systems
- For high end subs, Data allows them to increase ARPU from monthly fees, without massively discounting voice tariffs
- End result is stable voice pricing, higher ARPU, greater market penetration and higher margins

### Japan

- DoCoMo has 40M subs, 30M on Imode
- Of the 67.5million subs in Japan 71% of mobile subscribers use data services
- JPhones Sha-mail – low resolution photo mail sent as an email attachment for 17c
- NTT East and DoCoMopursuing WLAN services

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## Market Observations – Operator Input

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- Proving out initial data services models
- Enterprise users are primary market
- Operator focus is on optimizing voice cost structures  
TDM / Voice Switching Capacity still Growing (T2/T3)
- Primary traffic will remain voice—value add and differentiation based on data investments
- Fixed Voice Substitution
- The industry is still in the early stages of understanding the mobile internet
- All major operators plan to migrate to IP
- MMS driving data usage: Operators likely to push data services given commoditization of voice service; Successful launch could spur investment in GPRS capacity or faster migration to W-CDMA

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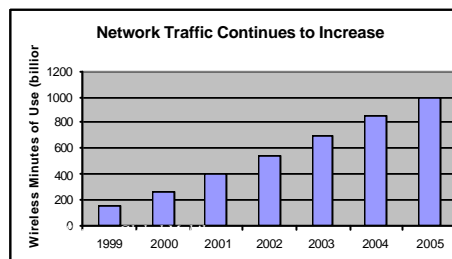
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## Despite Delays, Wireless Data Business Case Intact

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- 2.5G and 3G network rollouts initially slated for 2001 have been delayed into 4Q01 and 1H02
- Operators continuing their migration efforts
- Rising voice traffic pressuring network capacity
- Declining voice margins spurring carriers to offer data services
- Data services may help boost ARPU



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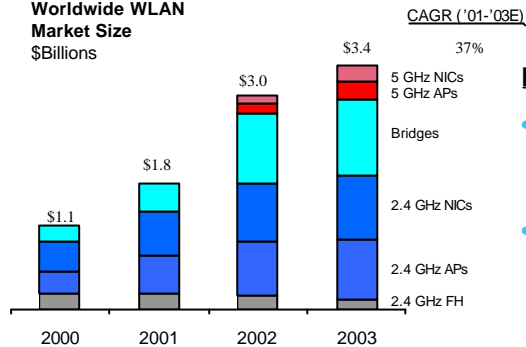
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## Market Trends

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**Worldwide WLAN  
Market Size  
\$Billions**



Source: Cahner's In-stat

### Market Trends

- Consumer and public access markets offer further market upside
- Market growth will include emerging segments using new/evolving technologies and standards.
- Increased recognition of productivity value of wireless and mobility

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## Operator Benefits

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- Develop corporate and consumer subscriber base
- Early launch of data services and applications
- Integration with 2.5G network
- Leverage current network investment
  - ✈ IP Core, content delivery, CRM, UM, etc
- Build partner and distributor relationships
- Capture high value/high-end, early adopter user for Mobile, PDA & PC.

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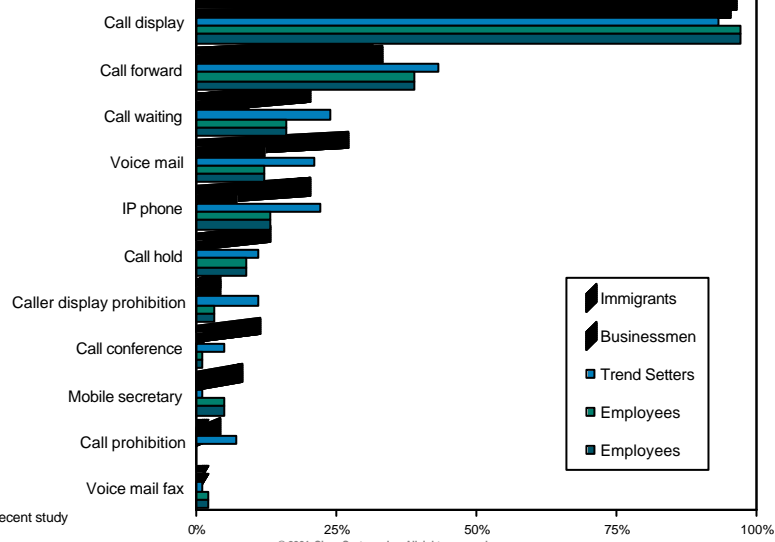
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## Adoption of voice value add services show steady advance

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In addition to voice, what value added Voice service do you subscribe to?



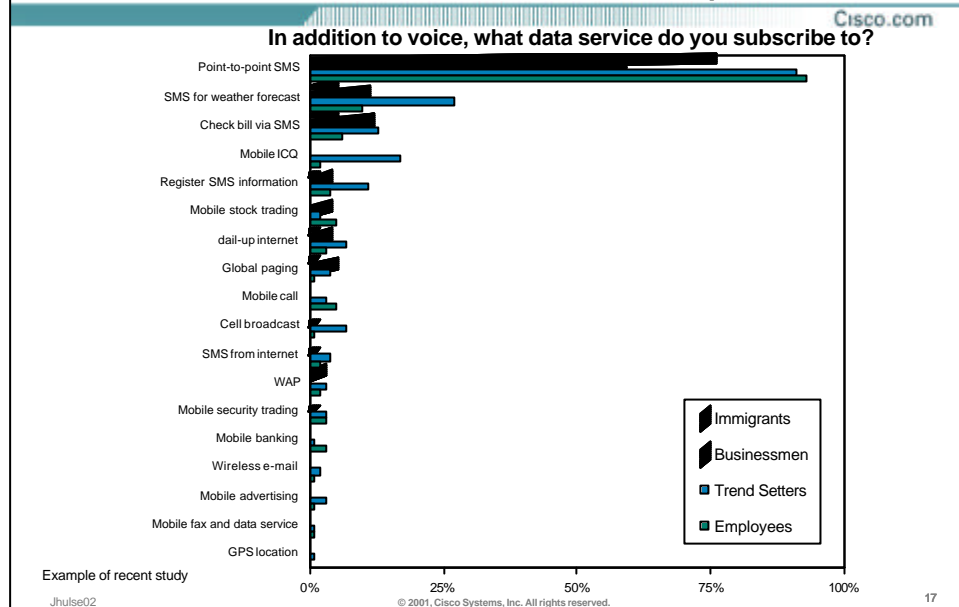
Example of recent study

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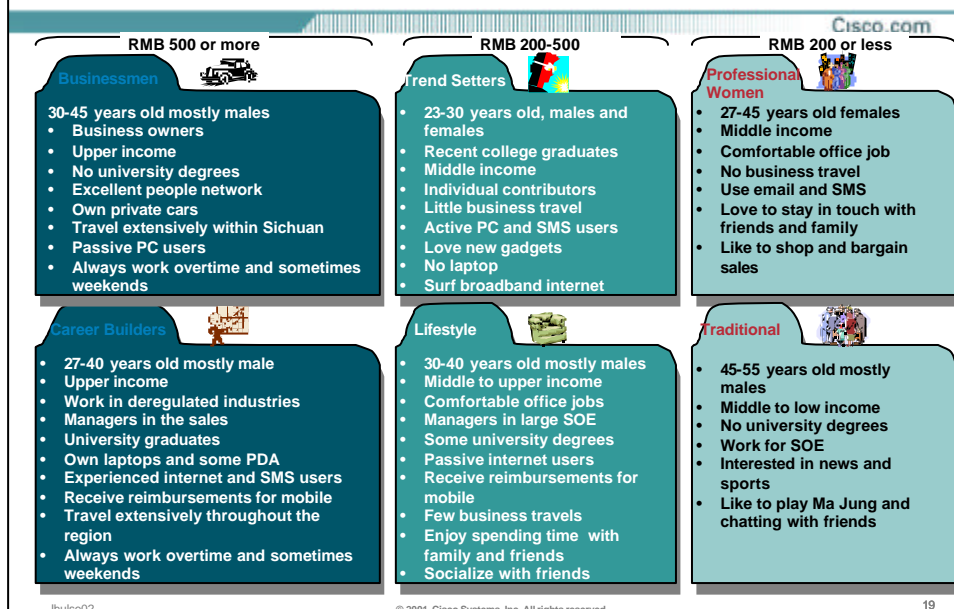
## Early mobile data services seem to follow the similar evolution path



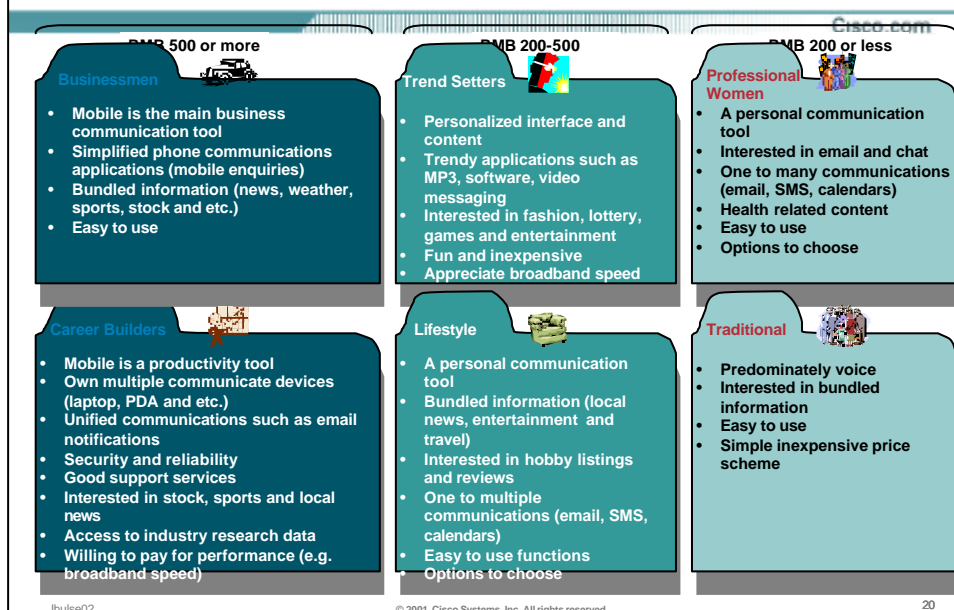
## Mobile data services would be adopted in three waves



# Portrait of a "China" MSP Customers



# Customer Preferences



## Profitable Data Services

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- Profitable data services no longer “over the horizon”
- Successful services essential for mobile service operators
  - ✈ Drive additional voice services
  - ✈ Anchor the subscriber
- Avoid the ISP trap
  - ✈ No content control
  - ✈ No user management
  - ✈ No billing options
  - ✈ No profitable revenue
- Three targets for profitable data services
  - ✈ Youth
  - ✈ “Pro”sumer
  - ✈ Enterprise

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## Market Needs How, Who, What & How Much

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- Today's mobile users in vertical network model limited to single user, single device, single access type, single service environment
- Moving to horizontal network model, delivering mobility across heterogeneous networks, users will simultaneously access services and applications via multiple devices and access networks.

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## How

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### Problem

- High-value data services requires end-to-end IP infrastructure to ensure security, quality of service, and optimized use of existing network
- Challenge compounded as access to enterprise data becomes more important

### Solution

- Implement operator class Mobile Data Center infrastructure
  - Layer 3 routing/switching
  - Server load balancing
  - Storage area networking
  - Managed firewall, security

**Result – Operator leverages end-to-end high performance IP infrastructure for data and eventual data/voice convergence**

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## Who

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### Problem

- As users move from pure voice to data/voice, they will use multiple devices on multiple networks—personality/presence blur
- This represents greater complexity:
  - Users may authenticate multiple times, as they access different services
  - Services must retrieve information from multiple sources with potentially different interfaces
  - Application providers must account for differing data repositories and interfaces (RADIUS, LDAP, HLR, etc), which slows down deployment of new applications

### Solution

- Provide mobile context registrar
  - Monitor subscriber presence (where presence equals context)
  - Aggregate subscriber presence across multiple devices and access networks
  - Aggregate persistent subscriber information across multiple repositories
  - Respond to queries from content sources

**Result – Operator manages user context and satisfaction, a key operator asset**

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## What

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### Problem

- Provide managed content access without owning all content
- Content management problem is acute because sites change and devices evolve at different rates, the operator is stuck in the middle
- Complexity increases as services take off and more enterprise and prosumer users become dependant on mission critical access

### Solution

- Provide Content Optimization Engine
  - Link optimization
  - Content compression
  - Markup-language translation
  - Session persistence
  - Device independence
  - Standards-based plug-ins to key applications

**Result – Operator provides a value add portal solution without having to train and support markup language and content experts**

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## How Much

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### Problem

- Data services billing based on value not minutes
- New revenue opportunities arise in real-time, requires switching and accounting at wireline speed based on browser type, URL destination, content type, availability, etc.

### Solution

- Provide Content Services Gateway
  - Transaction billing
  - Charge reversal for creation of new revenue and response services
  - Time of Day filtering to optimizing charging with available network
  - Parental control for wide ranging content delivery and control
  - Localized Banner Insertion for additional revenue
  - Redirection to Link Optimization to increase customer satisfaction experience

**Result – Operator aligns revenue opportunity with content value**

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## Market Structure for Ignition

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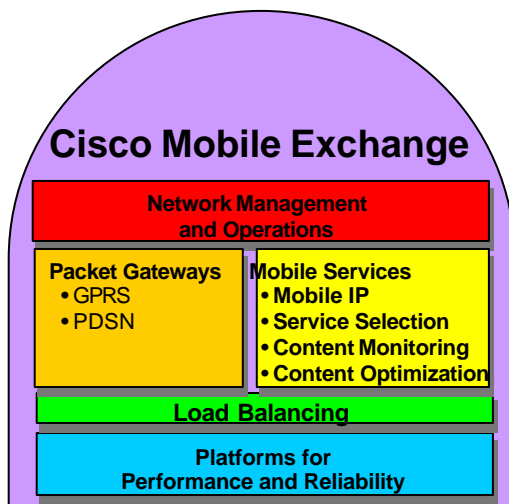
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## Cisco Mobile Exchange

### Successful data services for mobile operators

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- Framework of solutions targeted at the Subscriber Internet Edge
- Focus is to deliver cost effective and scalable solutions to meet the needs of Mobile Operators
- Leverage Catalyst 6500/7600 family, with mobile, IP, and content functionality

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## Mobile Data Application Segmentation

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### DATA

Most popular applications being developed this year

Applications	Cases (%)
E-mail	49.4
Instant messaging	39.1
Consumer e-commerce	37.7
Mobile positioning	33.9
Authentication	32.9
Wireless portal	32.1
Special vertical industry application	26.1
Customer relationship management	24.7
Sales force automation	23.7
Financial info	21.2
Field services	21.2

Source: Evans Data

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## Mobile Cisco.com

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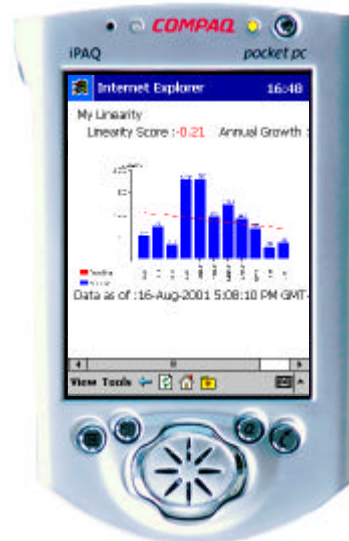
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## Mobile eSales

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## Partnerships Addressing Mobile Market

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- Comverse—partner for voice gateway services and SS7 GTM partner
- Openwave—partner for voice gateway services and mobile content solutions
- Logica—partner for voice gateway services
- IBM—partner for mobile infrastructure
- Italtel—IN partner for transit and SS7 GTM partner in EMEA
- CapGem/EY—SS7 GTM partner in EMEA, mobile portals
- KPMG—integrator for mobile content solutions and portals
- Portal—mobile IP billing



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## Holistic View of Cisco's Value Proposition To Mobile Operators



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## Final Thoughts

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- **Mobile data investments core to Mobile Operators' plans**
- **Enterprise services development important market for mobile data services**
- **Large Market Opportunity**
  - Operators seeking strong IP data experience to complement their traditional suppliers
  - Cisco momentum in target markets
  - Customers asking Cisco to do more
- **Mobile Operators adopting packet systems both for enabling data services and for voice optimization**
- **Managing how, who and what and how much will enable the Mobile Operator to enhance both top and bottom line**

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