



Today's Products Addressing Tomorrow's Needs

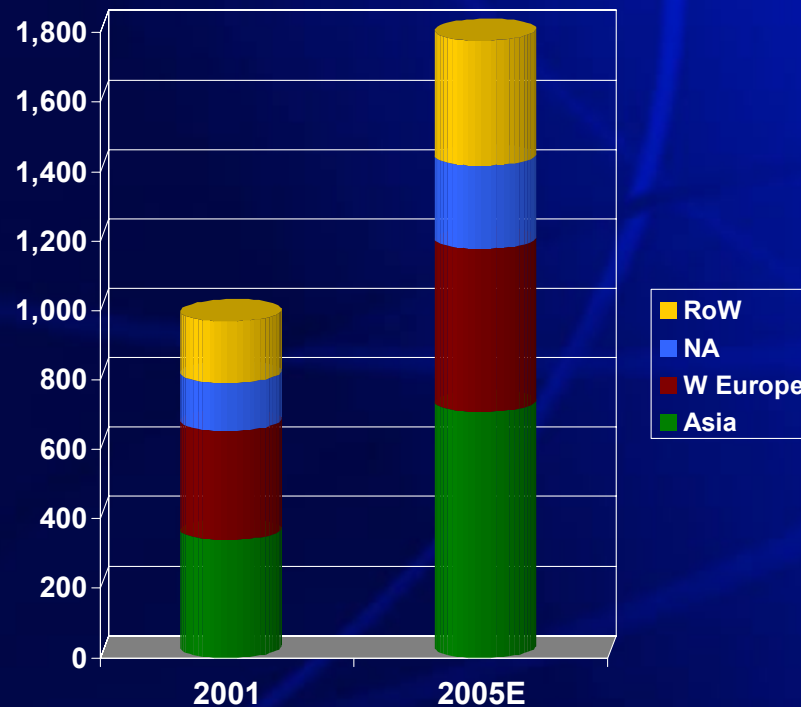
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Agenda

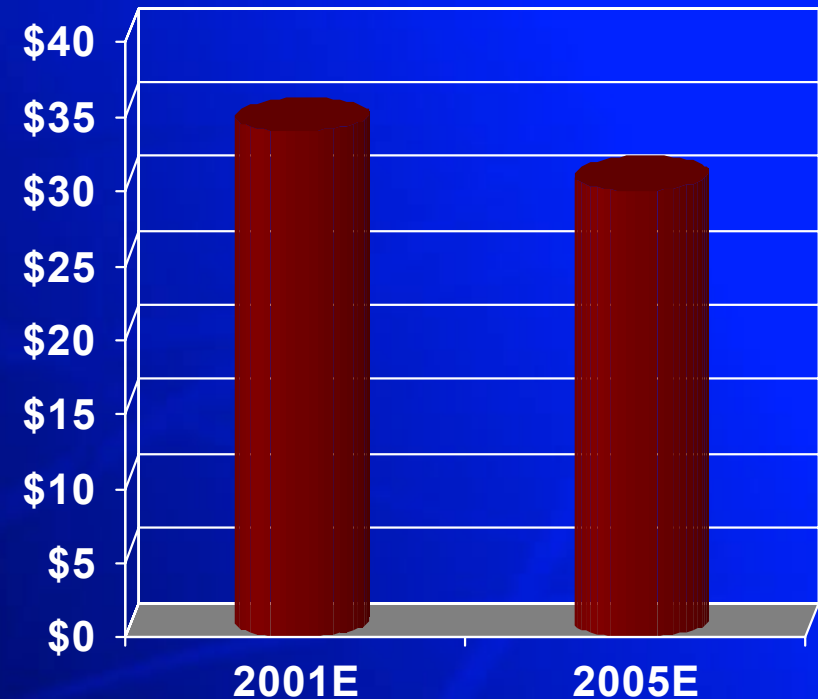
- **Market situation**
- **Technology Requirements**
 - Access Network Requirements
 - Core Network Requirements
 - Service Requirements
 - System Requirements
- **Conclusion**

Today's Market Reality

Global Subscriber Growth



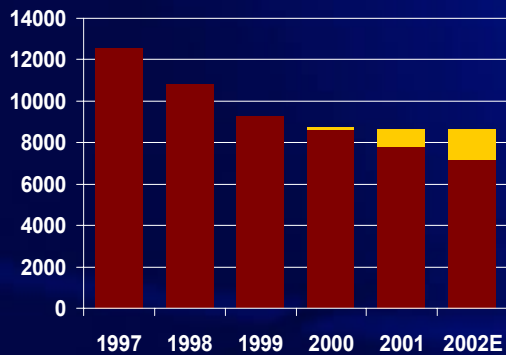
Global Voice Revenue Decline



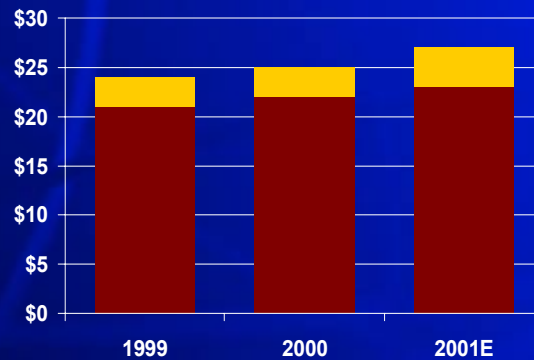
More and more paying less and less

Operator Revenue Opportunity

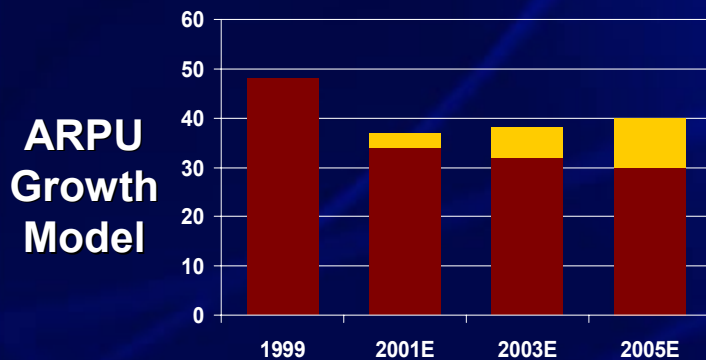
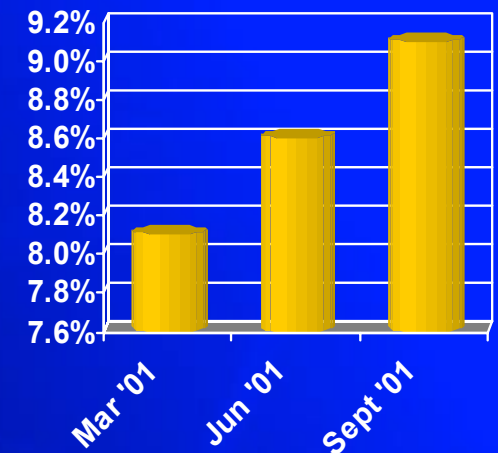
**I-mode
Average Revenue per User
DoCoMo**



**SKT (Korea)
Average Revenue per User
SK Telecom**



**Vodafone Non-Voice
Revenue
Previous 12 months - Vodafone, 2001**



■ Voice
■ Data

***Data ARPU will grow
Significantly with 3G***

The New Market Reality

2G

3G

Traffic

Circuit Voice
Circuit Data

Significant increase in network load

Packet Voice
Packet Data

Revenue

Voice only
Subscription
driven

Voice ARPU dropping, data filling the gap

Multiple
applications
Margin driven

Access

Time Division
Low Speed
Symmetric

Massive investment shift to Code Division

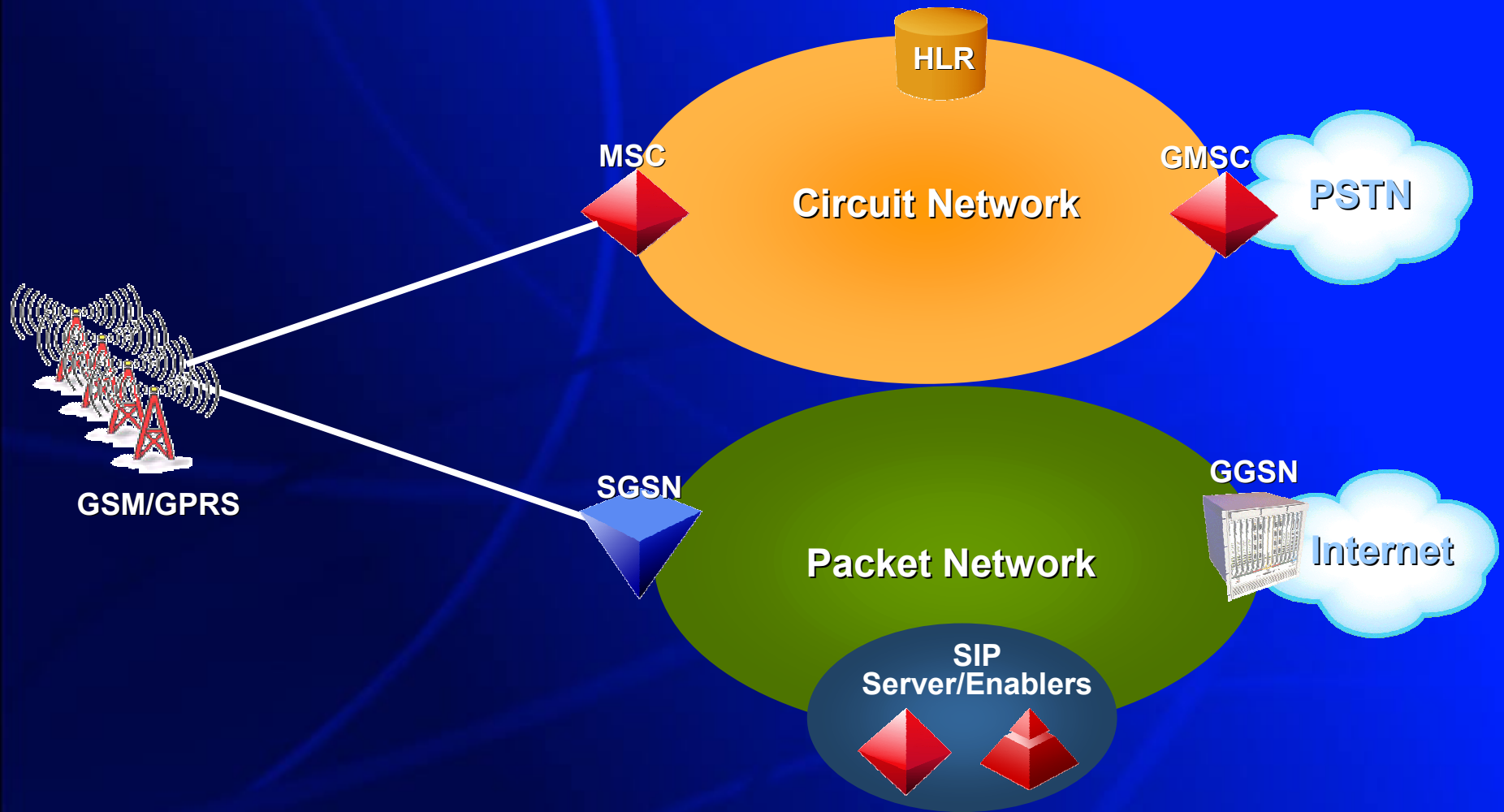
Code Division
High Speed
Asymmetric

Cost Structure lower, revenue potential higher

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Today's Network – GSM/GPRS

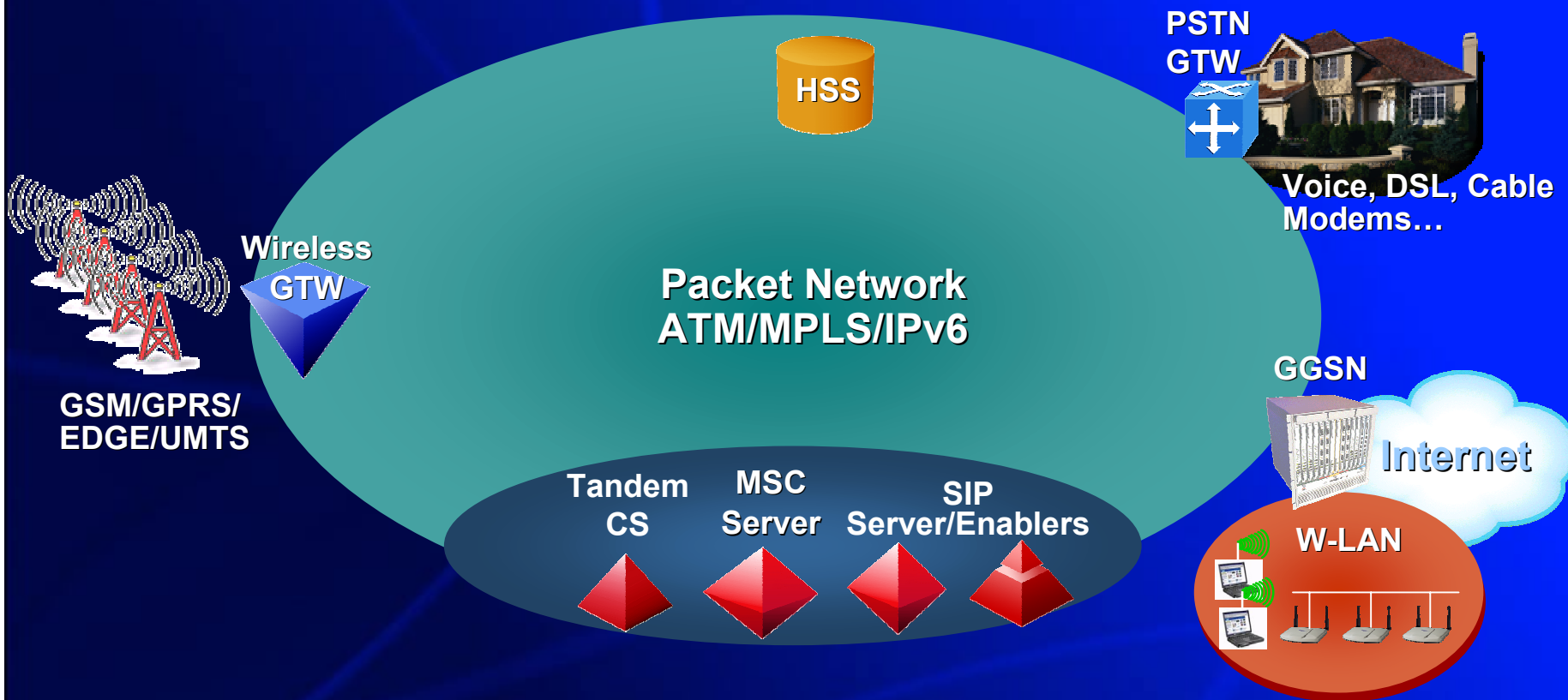


Separate Networks for low data penetration

NORTEL

NETWORKS ITU Seminar on IMT-2000 and systems beyond, Ottawa, 28 May 2002

Rel4/Rel5 All IP/Packet Network



Single Network for voice and data

Key UTRAN requirements

IP in the UTRAN

- Reduce Cost in Transport
- Simplify operations

Node-w

- Secure “WLAN type” technology
- Cost effective Hot-spot coverage solution

HSPDA

- Increase peak data rate throughput beyond 2 Mbps
- Increase overall capacity per carrier

UTRAN developments essential for reducing cost and driving revenue

Network Reliability

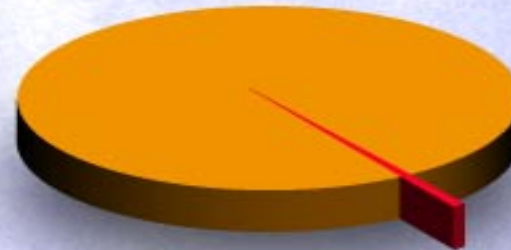
Data Networks



80%
Reliability

Downtime:
Average 4 Hours

Telecom Networks



99.999%
Reliability

Downtime:
<Milliseconds

UMTS Must Approach Carrier Grade Performance

(Pre-) Release 4 to Drive Down the Cost

Cost Reduction

- Transmission costs for voice can be reduced by 30%
- Network operations are simplified

Packet Investments

- Build a common Packet core for Voice & Data
- Rationalise investments in single technology

Multimedia Preparation

- R5 Multimedia domain requires some R4 features
- Enable an early multimedia offer

***Deployment of R4 is dependant on Cost Structure
R3 and R4 can co-exist***

(Pre-) Release 5 to Drive the Revenue

Multimedia Services

- Standard set of defined multimedia services defined
- Improved user interfaces

Quality of Service

- Mechanisms to deliver realtime services over Packet
- Services to be available when roaming

Cap TDM Investments

- All new services can be developed in Packet domain
- TDM switching can be capped or phased out

***R5 is focused on driving revenue
R3, R4 and R5 can co-exist***

Service Layer Requirements

Open Systems Architecture

- Independent applications and service enabler layers
- Goal is to reduce Time To Revenue (TTR)

Simplified APIs

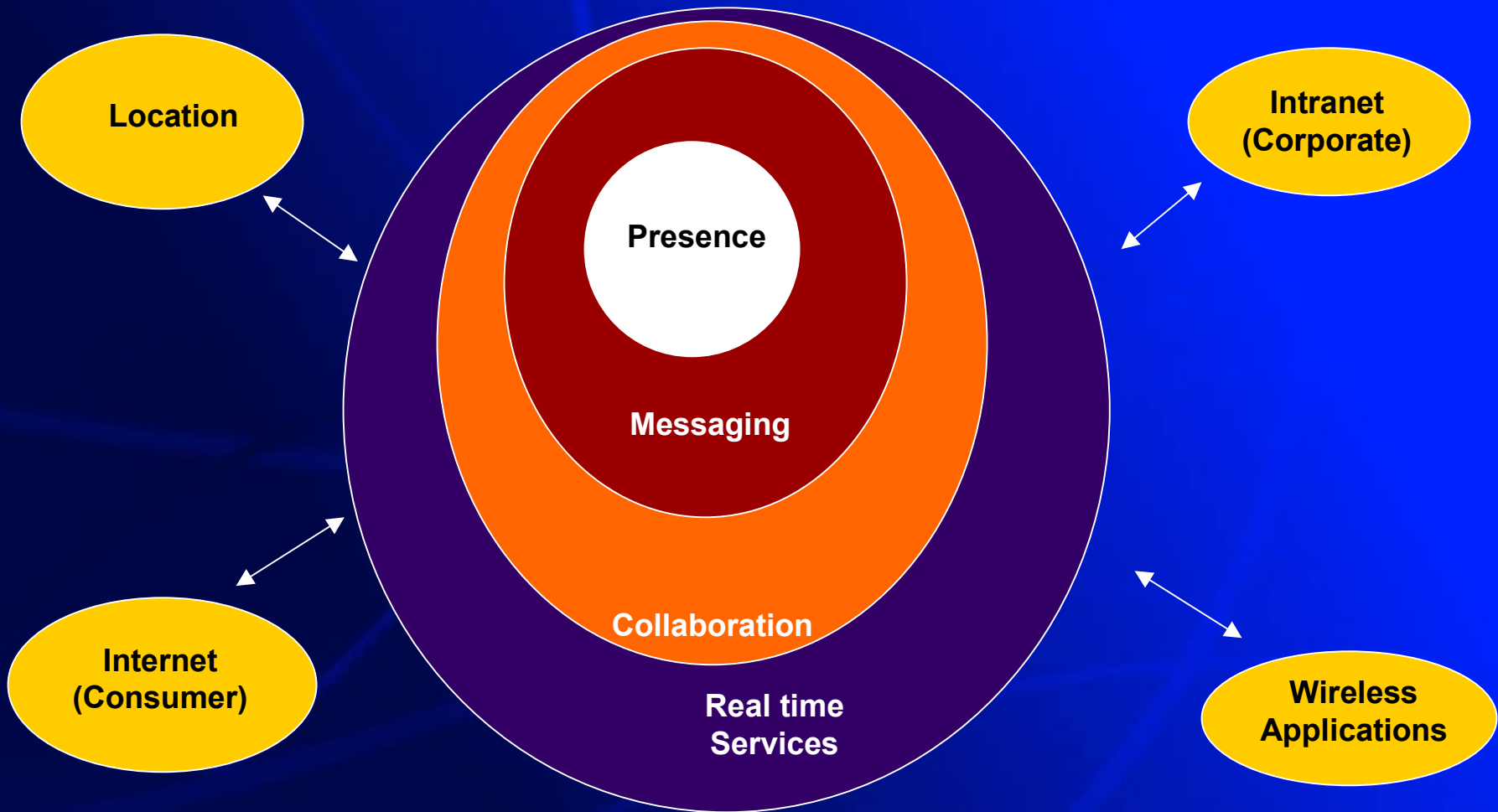
- Development must not be complex
- Need to leverage “web based programming” world

Rich Enabling Network

- Enabler layer must provide “detail” for apps layer
- Billing systems must be flexible

Operators must be able to make money from data services in a simplified way

What are the Services?



New Revenue Opportunities using existing business models

System Requirements

Infrastructure IOT

- Vendors must work together
- Operators must help facilitate

Device IOT

- Devices are key to success of any mobile standard
- Standards must be flexible, yet strict!

Applications IOT

- Applications will be the key to UMTS success
- Ease of 3rd party service introduction is essential

IOT is essential for industry to grow – sounds obvious, but it can be difficult

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Conclusions

- **3G is real – it will happen, it must happen**
- **For 3G to be successful, we must learn our lessons from WAP and GPRS – sell value, not technology**
- **Standardization is key to ensure competitiveness**
 - To drive down cost
 - To drive up revenue
- **Vendors must work together, leveraging the standards, to push the industry forward**