

Convergence – The Main Stream for Telecom Industries and Networks

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Characteristics of the Traditional Telecom Industries

- ❖ Cost and profit are under strict control
- ❖ High entry cost and technology + high Tarrif
- ❖ **One service/one system/one policy,**
Telephony is the center for everything
- ❖ **Technology = Service, different networks
support different services**
- ❖ Different service dictate different markets,
different industries and different regulations
- ❖ Low risk and high profit

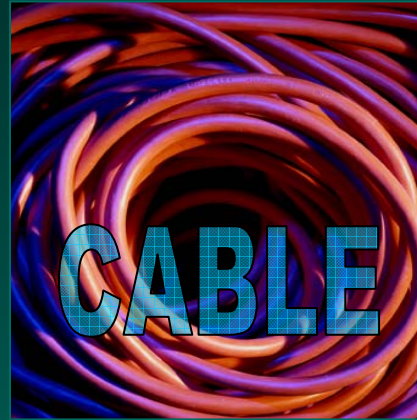
Characteristics of Future Telecom Industries

- ❖ Voice becomes one application on Internet
- ❖ Full service + All IP is target
- ❖ Networks move towards convergence
- ❖ Industries move towards convergence
- ❖ Competition pressure and economic scale leads back to partial monopoly
- ❖ Telecom industry becomes low profit
- ❖ Content operators will likely become center of telecom value chain

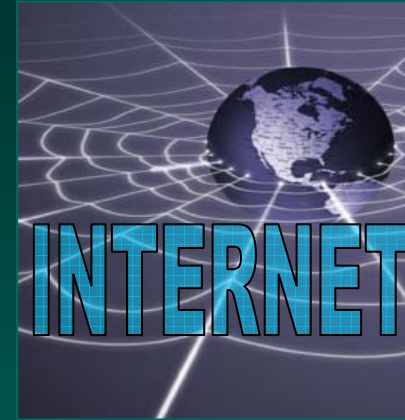
Three Networks



- **Low BW**
- **Voice – Full service**
- High quality, high cost
- Strict ST
- **Middle regul.**

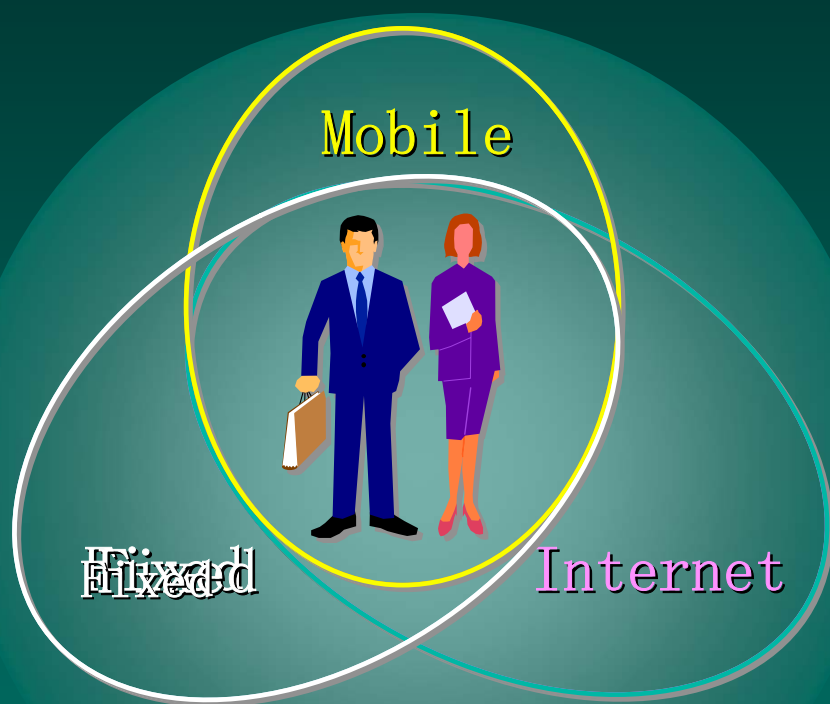


- **High BW**
- **Video – Full service**
- Middle qual., Middle cost
- Loose ST
- **Strict regul.**



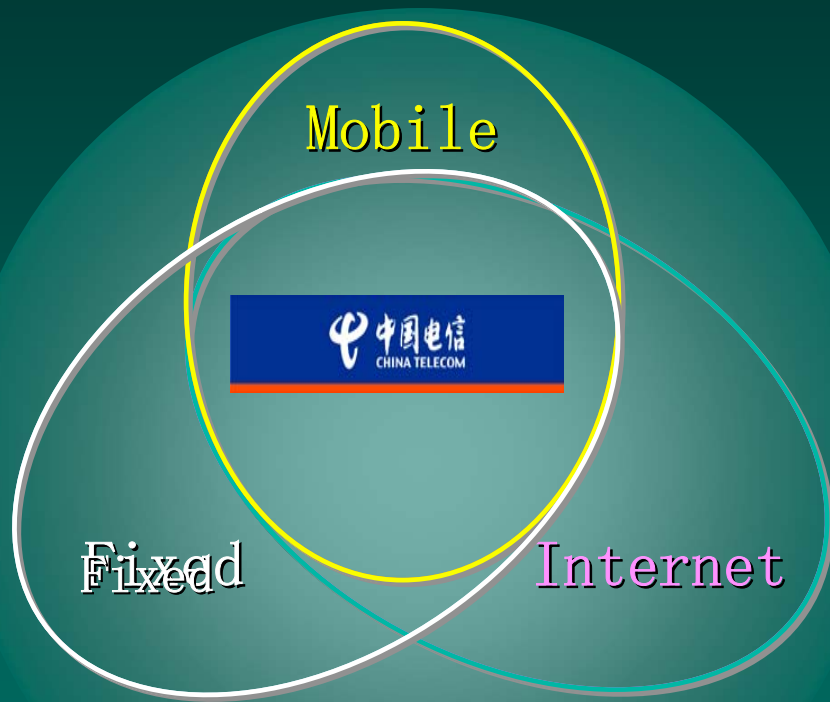
- **Variable BW**
- **Data – Full service**
- Low quality, Low cost
- Loose ST
- **Loose regul.**

Benefits of Convergence for Customers



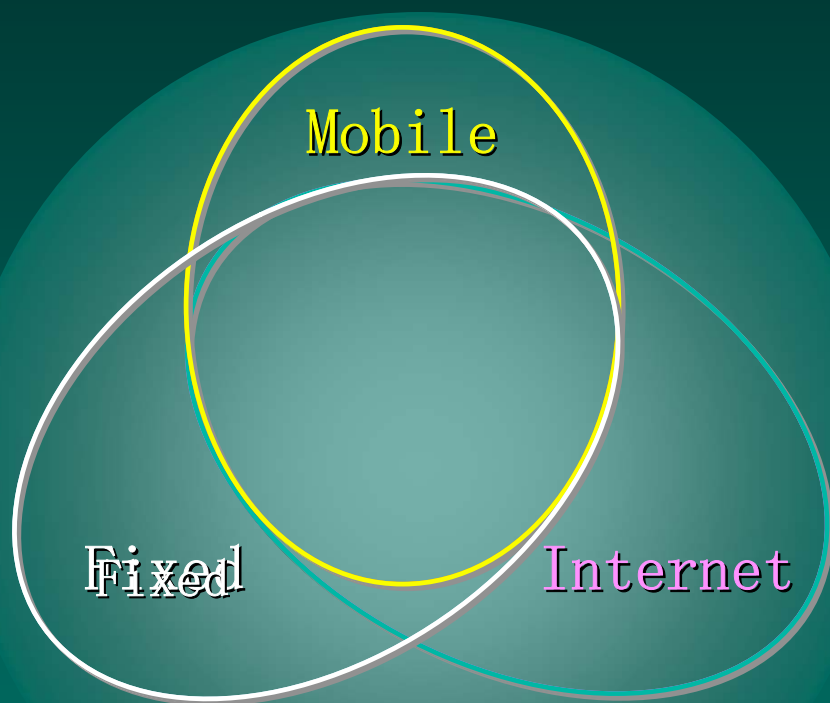
- ❖ **Unified products**
- ❖ **Single same access cross fixed/wireless/Internet**
- ❖ **Single bill**
- ❖ **Identical experien. indep. to access**
- ❖ **Simplified customer relation**
- ❖ **Fast service prov.**

Benefits of Convergence for Operators



- ❖ Unified and simplified network archit., interfaces and protocols
- ❖ **Fast service prov.**
- ❖ **Low capex/opex**
- ❖ **New services/appl.**
- ❖ Simplified customer relation
- ❖ **Low market risk**

Benefits of Convergence for Vendors



- ❖ Reduced equipment types, interfaces and protocols
- ❖ Focused R&D and production line
- ❖ **Low R&D, product. and marketing cost**
- ❖ **Low market risk**
- ❖ Simplified customer relation

Implications of Convergence and integration

- ❖ **Convergence: NGN**

Moving objects come towards each other and meet at a point

- ❖ **Integration: ISDN/B-ISDN**

Combine something in such way that it becomes fully a part of something else

- ❖ The reason why NGN chose convergence as target rather than integration is simple because the lessons taken from ISDN/B-ISDN

Implications of convergence of three networks

- ❖ Real implications of convergence of Telecom, Internet and Cable networks are:
 - **Technology:** tends to similar choices such as interfaces and protocol, etc
 - **Network:** interconnects each other
 - **Service:** each network can support all services, esp. Triple Play-Multiple Play
 - **Application:** adopts unified IP protocol
 - **Regulation:** unified
 - **Infrastructure:** independent to each other

Same Target with Different routes

❖ **Telecom route:**

voice -- voice + data -- voice+data+vedio
(triple play), IPTV is cutting point

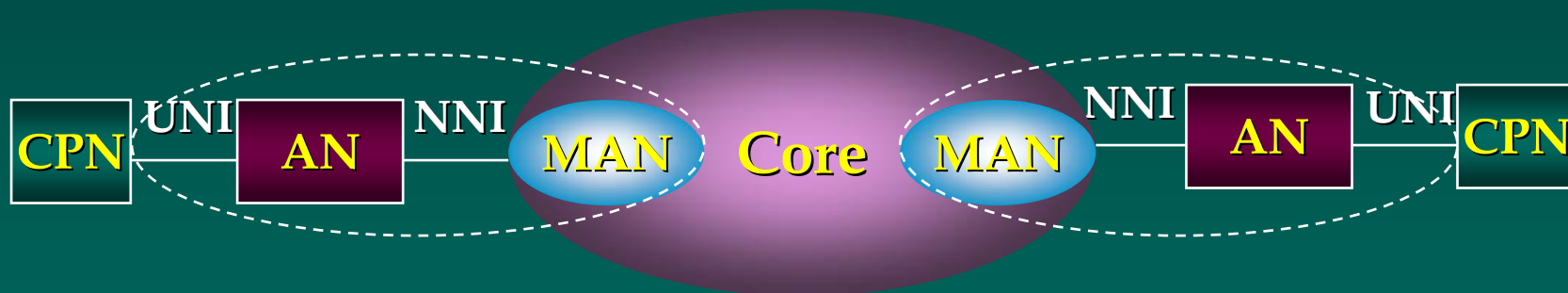
❖ **Cable route:**

vedio -- vedio + data -- vedio+data+voice
(triple play), DTV is cutting point

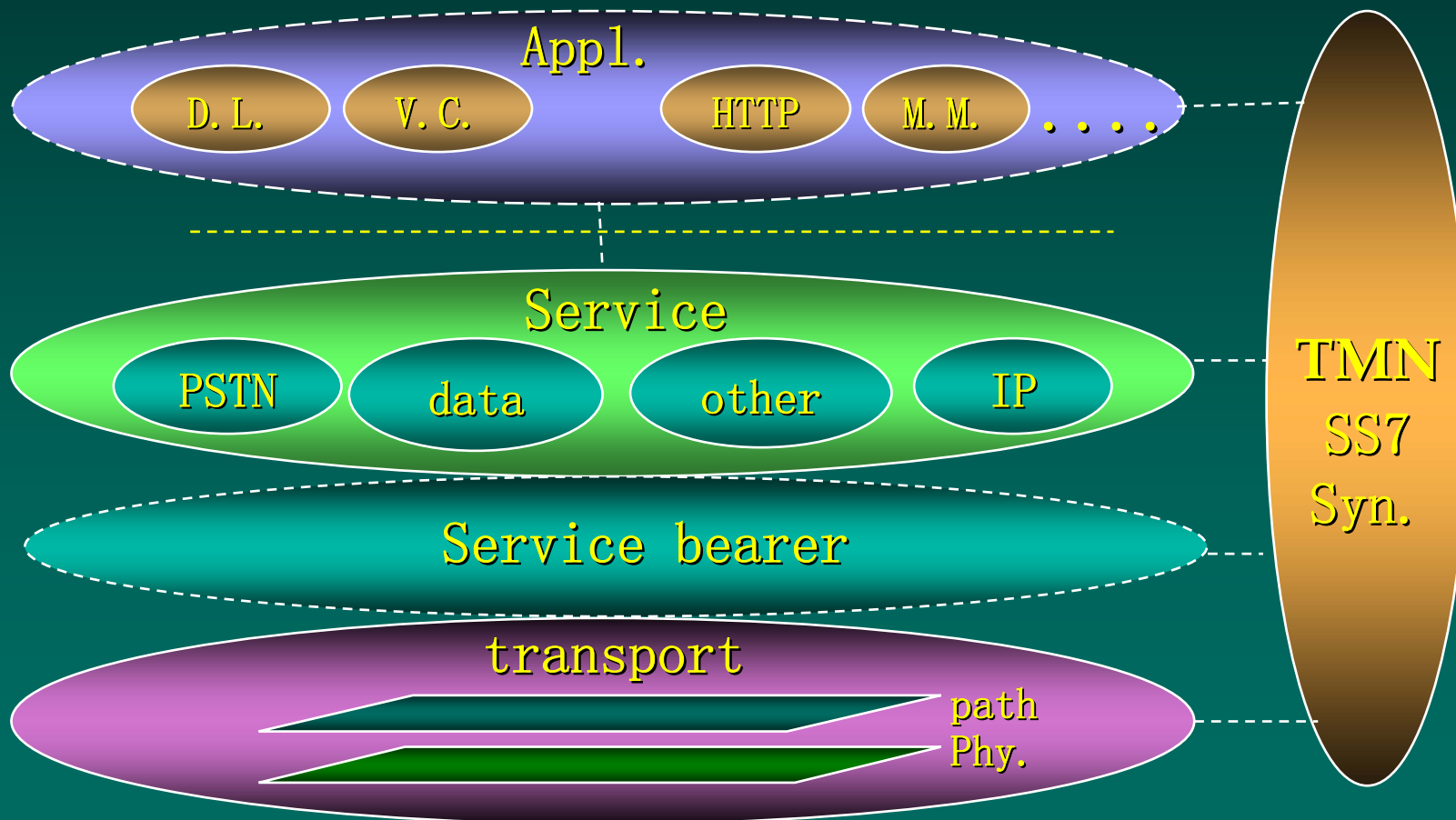
❖ **Internet route:**

built in unified protocol and transport
platform support all service from the
beginning

Horizontal view for telecom networks



Vertical view for telecom networks



Current status



- ❖ Many stove like service platforms based on “Technology=service”
- ❖ **Each service has his own network platform and service platform :**
Such as PSTN, PMTN
ATM, Internet, etc.

Convergent service bearer

- ❖ **Two tier net.:** Vanilla + Premium Net
- ❖ **A unified IP/MPLS based core network** will become multi-service convergent network platform supporting all services
- ❖ Dozens of networks will be replaced by a single IP/MPLS service platform
- ❖ **Carrier grade services** will be supported by FRR (50ms) and IP fast convergence (sub second)

Convergent control layer

- ❖ **Access independent core network**
- ❖ IMS will likely become a unified fixed and mobile convergent platform
- ❖ Separated service layer and control layer make easy to produce unified service logic
- ❖ Openness, standards and convergence
- ❖ **Unified core, session control, service and application platform, subscriber data register, back office charging, AAA architecture and network roaming, etc.**

Convergent MAN

- ❖ **Multiple convergent platforms at network edge are available to support TDM, ATM, Ethernet interfaces and unified provision and management**
 - SDH based MSTP
 - Ethernet based (VPLS, MacinMac/PBT)
 - WDM based (ROADM)
 - ATM based
- ❖ **Physical convergent: same box with different service slots**

Convergent AN

- ❖ Convergent common access platform
- ❖ Three main platforms:
 - **B-DLC: mixed TDM + packet** architecture suitable to migrate from PSTN to SS/IMS and broadband gradually
 - **DSLAM(xDSL): packet architecture** suitable to migrate from PSTN to SS/IMS and broadband rapidly
 - **OLT(xPON): packet architecture** suitable to migrate from PSTN to SS/IMS and broadband more rapidly

Convergent wireless Tech.

- ❖ **Convergent 2G/2.5G/3G core (R4 version)**
- ❖ **Multiple bands and modes terminals**
- ❖ **Convergence of CDMA and WCDMA**
Same platform for BS and IMS core
- ❖ **Convergence of WCDMA and TD-SCDMA**
Same core and MAC above upper layer
- ❖ **Convergence of fixed and mobile access**
Unified AAA/Charging for GSM/WCDMA/WLAN
- ❖ **OFDM and MIMO** become common tech.
for all next generation broadband wireless

Tortuous and Bright Road

- ❖ Convergence does not reduce variety and may produce even more services and appl.
- ❖ **Convergence will face many challenges, unforeseen pitfalls, and great complexity** when considering hardware, software, disparate technologies and networks, legacy systems, operating systems, billing systems, security, regulation issues etc. in whole
- ❖ **Road to convergence is long and probably never ended marching**

Thank you!