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Unified Communications

Cutting Edge Innovation or Déjà vu?

Dr. Fiona Lodge

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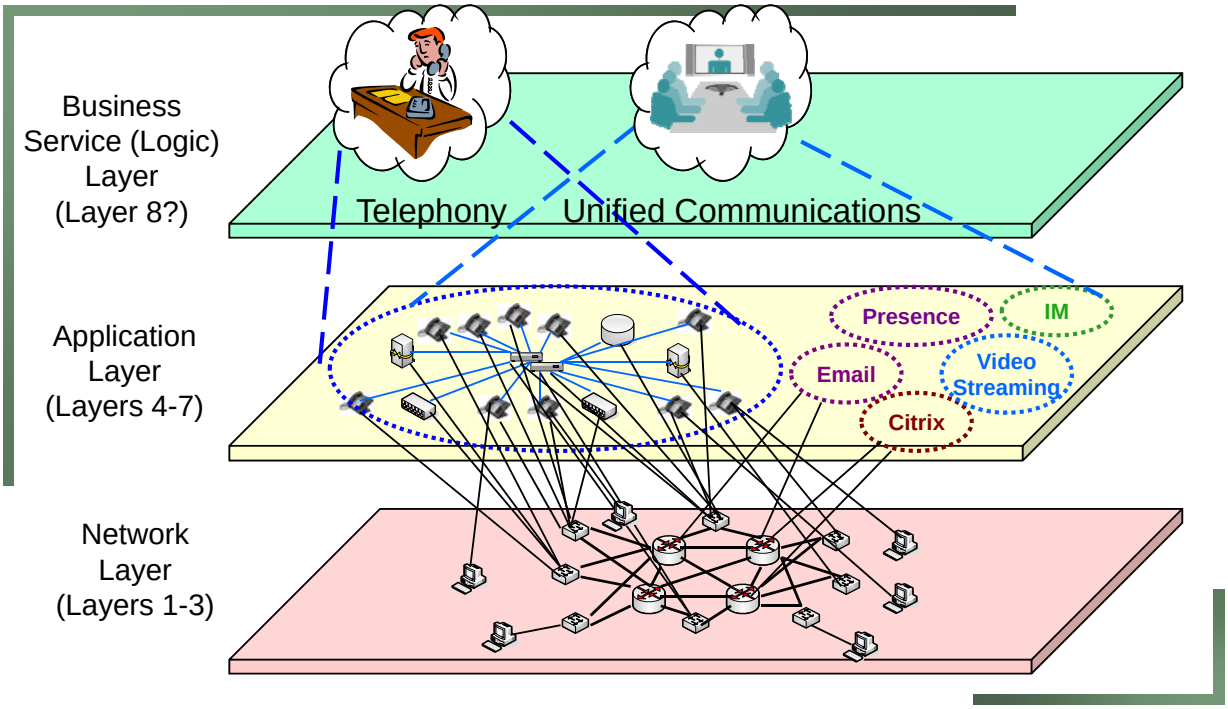
"Unified Communications", *circa 2006*



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So where did it all start?

- Voice
  - Analog telephony was invented in 1876
  - Unshielded twisted pair was first used in 1881
  - Telephony started going digital in the late 1970s/early 1980s
- Video
  - The first public video telephone service was launched in 1938 by UK and German national post organisations (actually used two closed-circuit TVs connected via cable)
- Data
  - Telegraph was invented in 1753
  - Facsimile/telefax was invented in 1842 and provided as a service by national post organisations
- Service Logic
  - Both Analog PBXs and Centrex were invented in the 1960s

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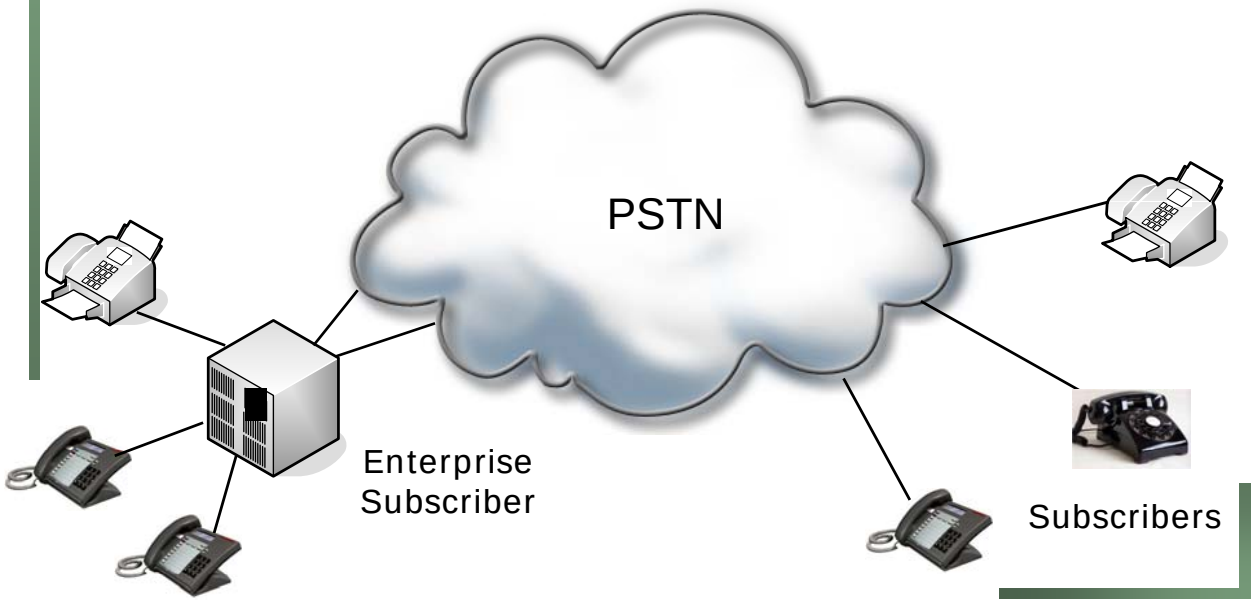
Telecoms Networks *circa 1992*



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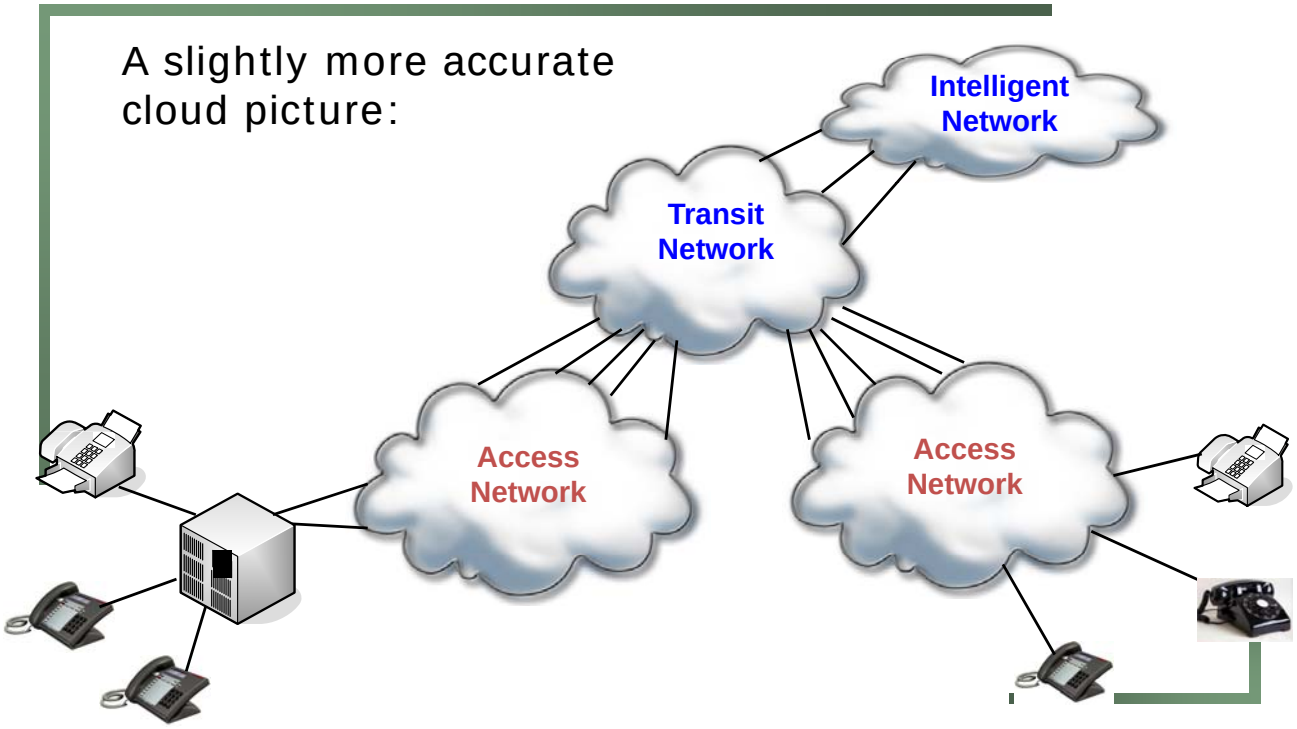
Telecoms Networks *circa 1992*



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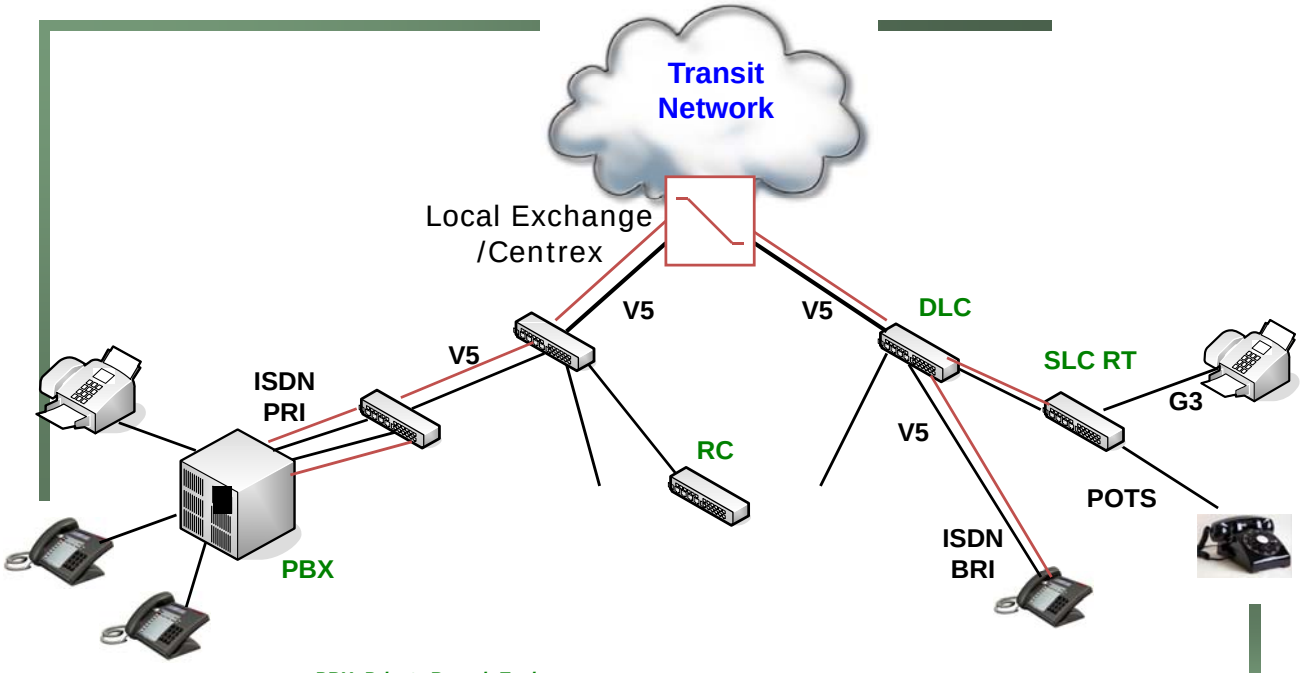
Access Networks *circa 1992*



PBX: Private Branch Exchange
DLC: Digital Loop Carrier
SLC RT: Subscriber Loop Carrier Remote Terminal
RC: Remote Concentrator

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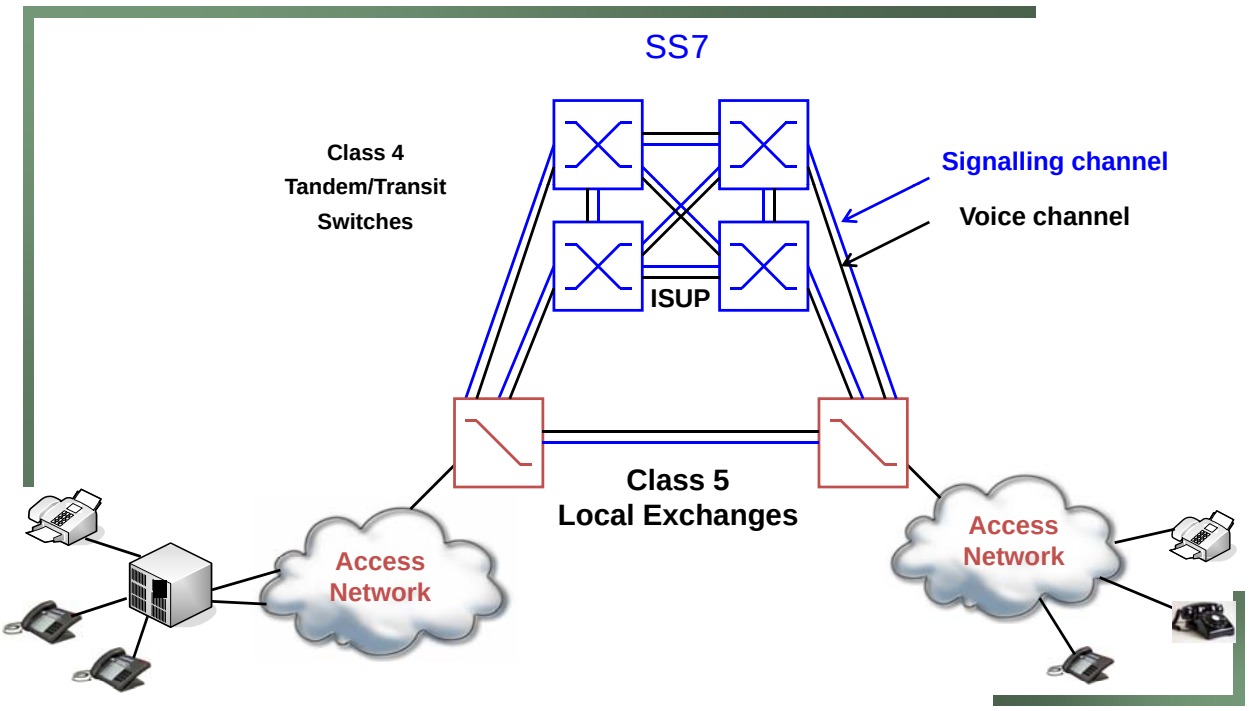
Transit Networks *circa 1992*



SS7: Signalling System Number 7
ISUP: ISDN User Part

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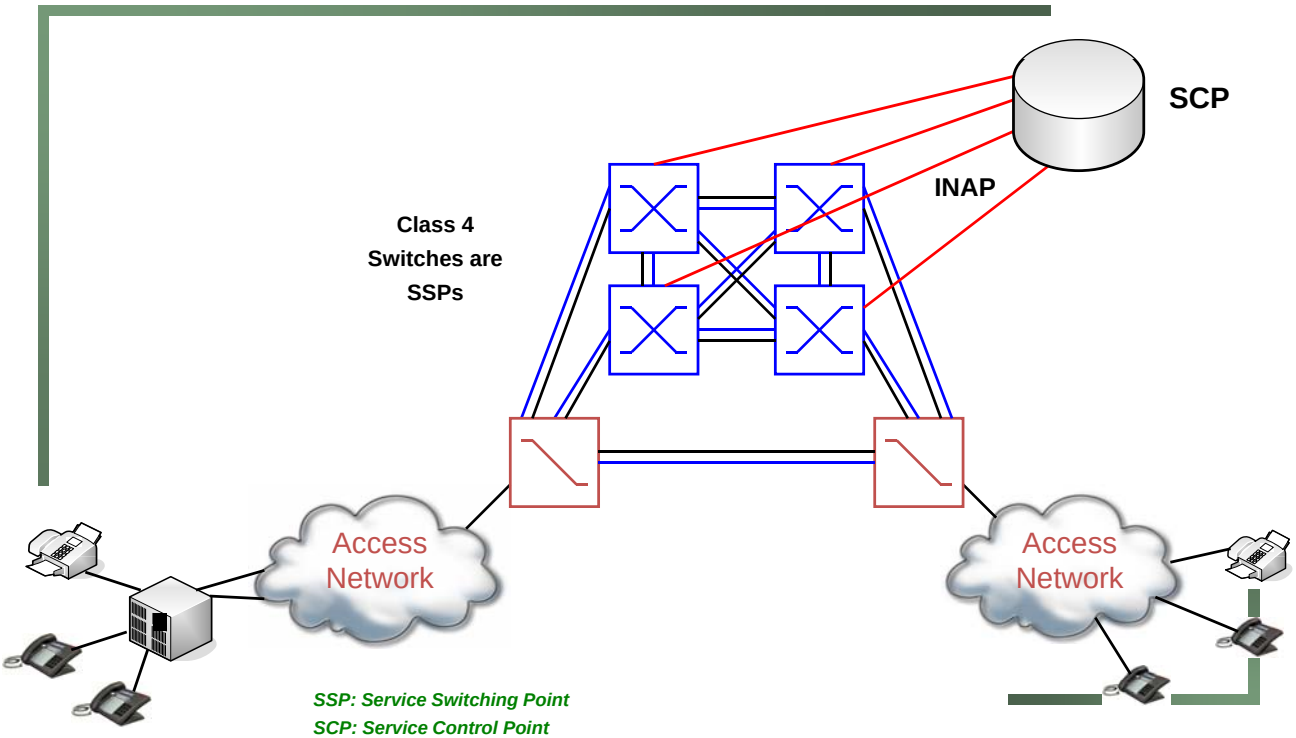
Intelligent Networks *circa 1992*



SSP: Service Switching Point
SCP: Service Control Point
INAP: Intelligent Network Application Part

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"Integrated Services" – Take 1: '88-'95

Carrier "Unified Comms" Infrastructure:

- Integrated Services Digital Network
  - Digital line (BRI/PRI) provided by carriers to businesses and subscribers
  - Integrated Voice, Video and Data services on the same line
  - Supported intelligence/service logic directly on the customer premises
- SS7 (Blue/White)
  - Signalling backbone for Voice and Video calls
- IN Capability Set-1
  - Service Logic layer for 2-party Voice and Video calls
  - First standardised 3rd Party Call Control (3PCC) technology

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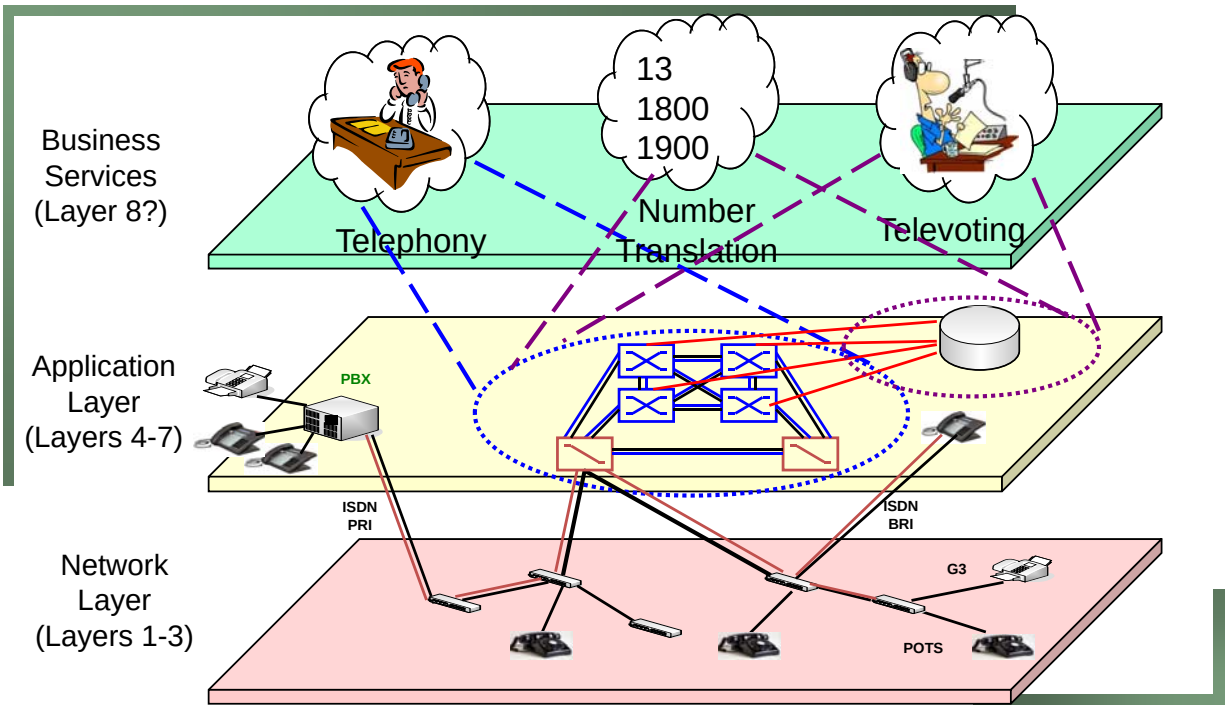
Carrier Services on ISDN/SS7/IN'88: Early to mid-'90s



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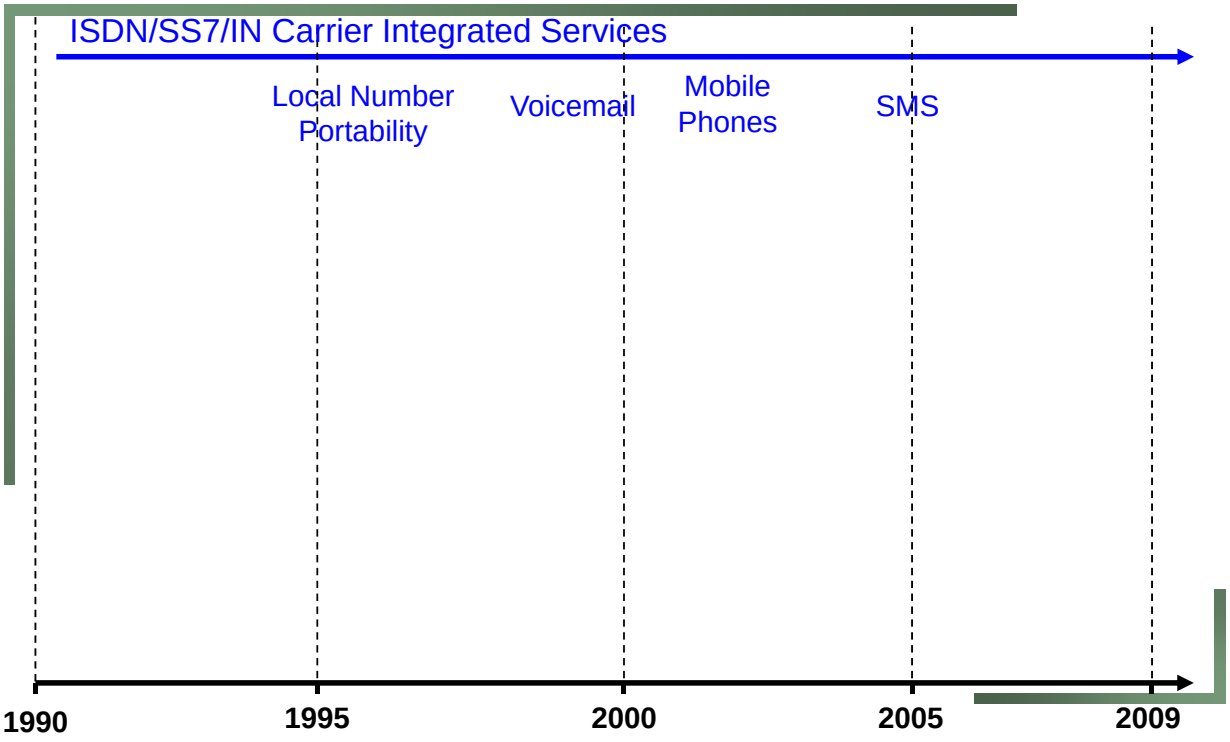
Evolutions of “Unified Comms” – Take 1



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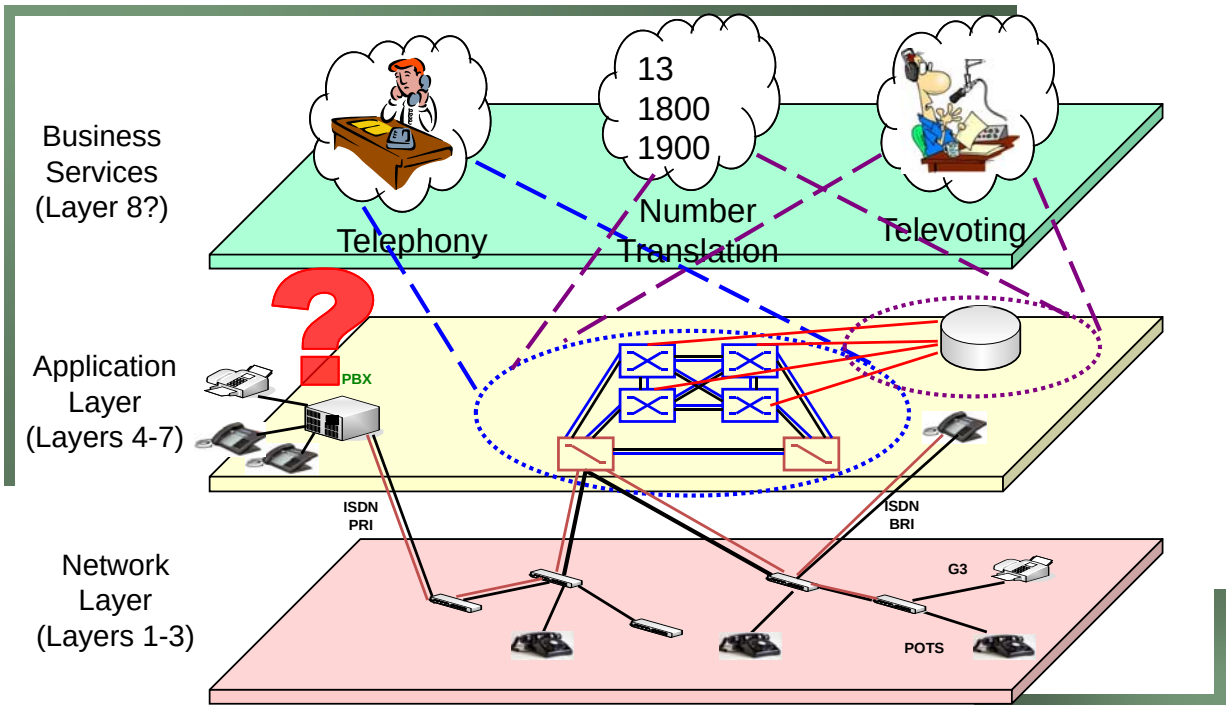
Carrier Services on ISDN/SS7/IN’88



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"Multimedia" – Take 2: '90-

- Service Logic on Customer Premises
- The advent of ISDN, supporting intelligence on customer premises, led to a number of new converging Voice/Video/Data applications from various vendors during the '90s:
  - Multi-party audio conferences
  - Videoconferencing
  - Call centres (outbound & inbound)
  - Unified Messaging (Octel voicemail in Outlook)
- Some apps were proprietary; others were based on various Computer-Telephony Integration (CTI) 3PCC APIs and protocols
  - CSTA, TSAPI, TAPI and later, JTAPI

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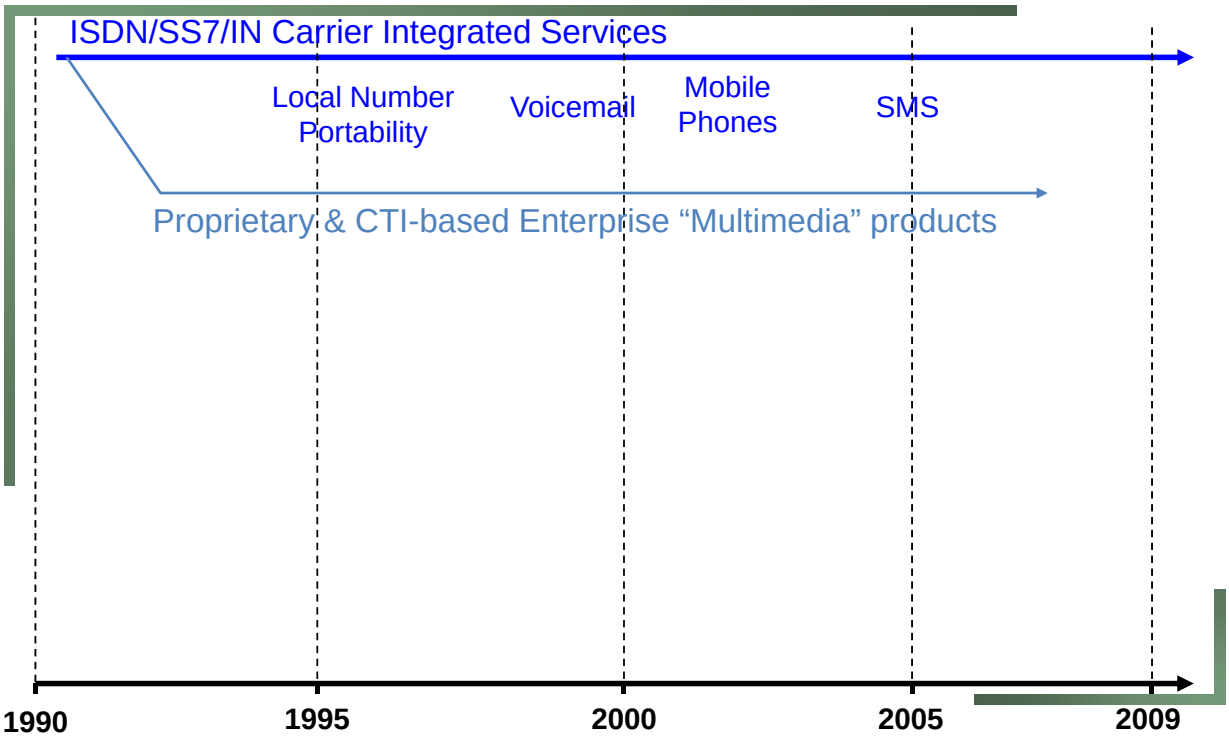
Evolutions of "Unified Comms" – Take 2



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A Plethora of Research Initiatives: 1994-1998

The Goal:

Open, transparent service and network architectures for the delivery of ubiquitous multimedia services

- Broadband-ISDN: Focussed on ATM as the unifying Layer 2 for all voice, video & data services
- The GSM Forum converged data into 2.5G mobile devices using GPRS
- TINA (Telecoms Information Networking Architecture) defined multimedia service architectures and middleware for distributed application/service control
- Broadband-IN raised its head for a year or two, but gradually went away, as TINA gained momentum
- OpenSIG tried to derive open signalling and middleware standards for ATM-, Internet- and Mobile-multimedia networking platforms
- The NMF/TMF tried to figure out how to manage these environments

EVERYONE in the various research communities still considered that all media would be over TDM/ATM

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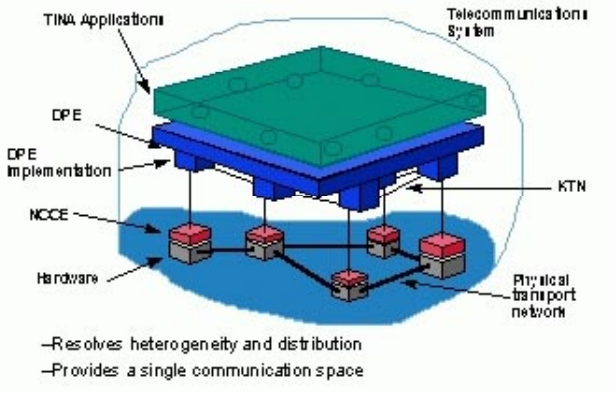
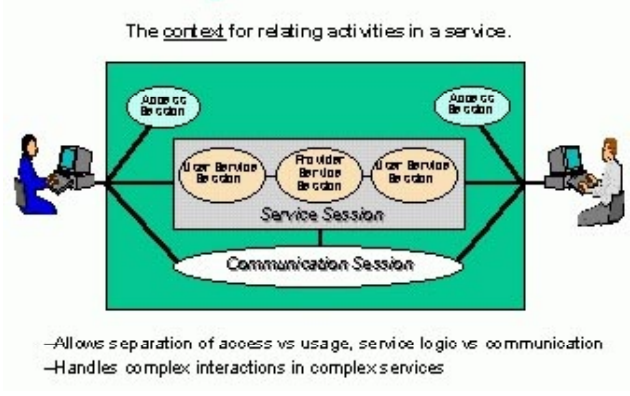
TINA – Take 3: '91-'00

- Provided a framework for multimedia
  - video conferencing,
  - document sharing
  - shared workspaces

  with service and media control logic over CORBA/IP and media over ATM
- It worked, but was slow





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TINA – Take 3: ’91-’00

The major innovations from TINA were

- Data was truly integrated into the architecture from Day 1
- The popularisation of “Middleware” to provide an abstraction layer between Application Logic & Network
- User Application Logic & Provider Application Logic, with well-defined APIs between them, formally recognised the value of “intelligence at the edge” and opened up the telecoms space to non-telcos for the first time

The major mistake TINA made was

- Being tied too closely to ATM and CORBA

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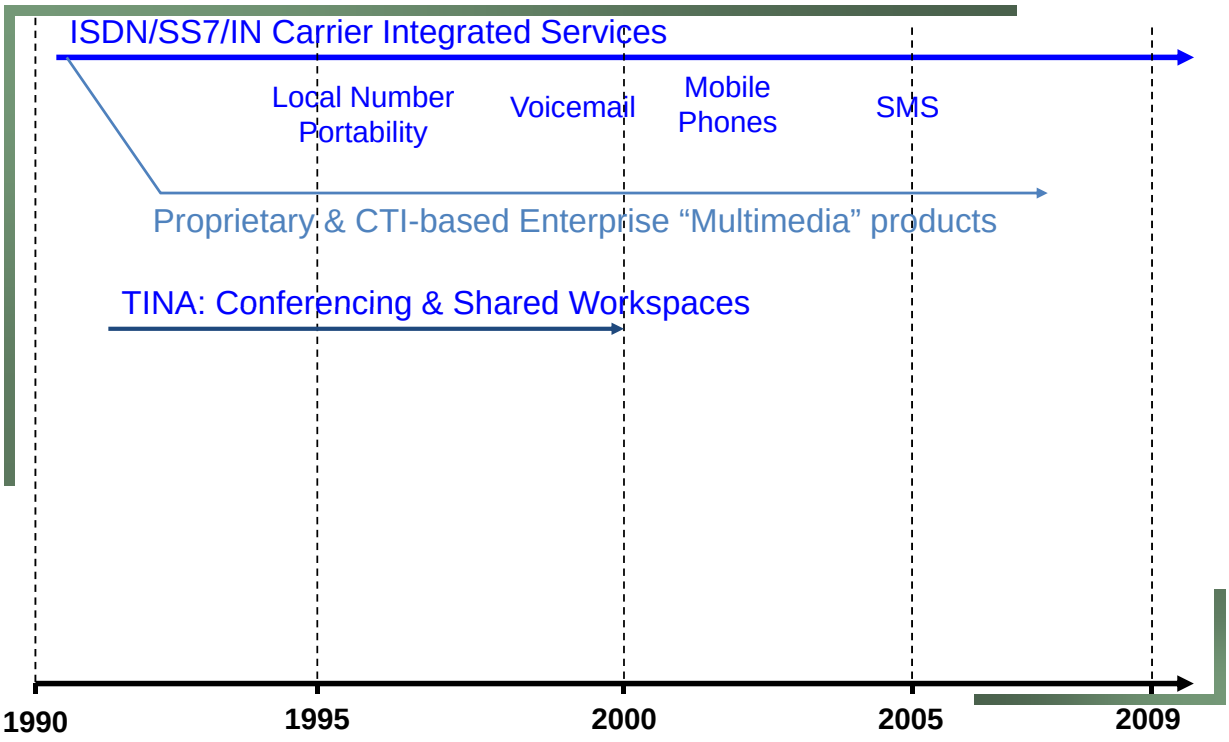
Evolutions of “Unified Comms” – Take 3



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Meanwhile, back at the ranch…

- The World Wide Web and email exploded into popularity
- ISPs popped up everywhere
- PCs and modems became cheap commodities
- Java was released as freeware in 1997
- The first VoIP apps and cards started appearing in 1995, for “free calls over the internet”
- RTP was standardised by IETF in 1996
- H.323 was standardised by ITU-T in 1996
  - Its intent was to support videoconferencing across heterogeneous packet-switched networks
  - It did support transiting both signalling and voice/video over LAN environments, because it expected the videoconferencing units to be located in the LAN and therefore needed to transit the LAN to get to PSTN/ATM environments
- From 1996-1998, H.323 products gained in popularity, with people and organisations using them to make voice and video calls across the LAN, WAN and internet

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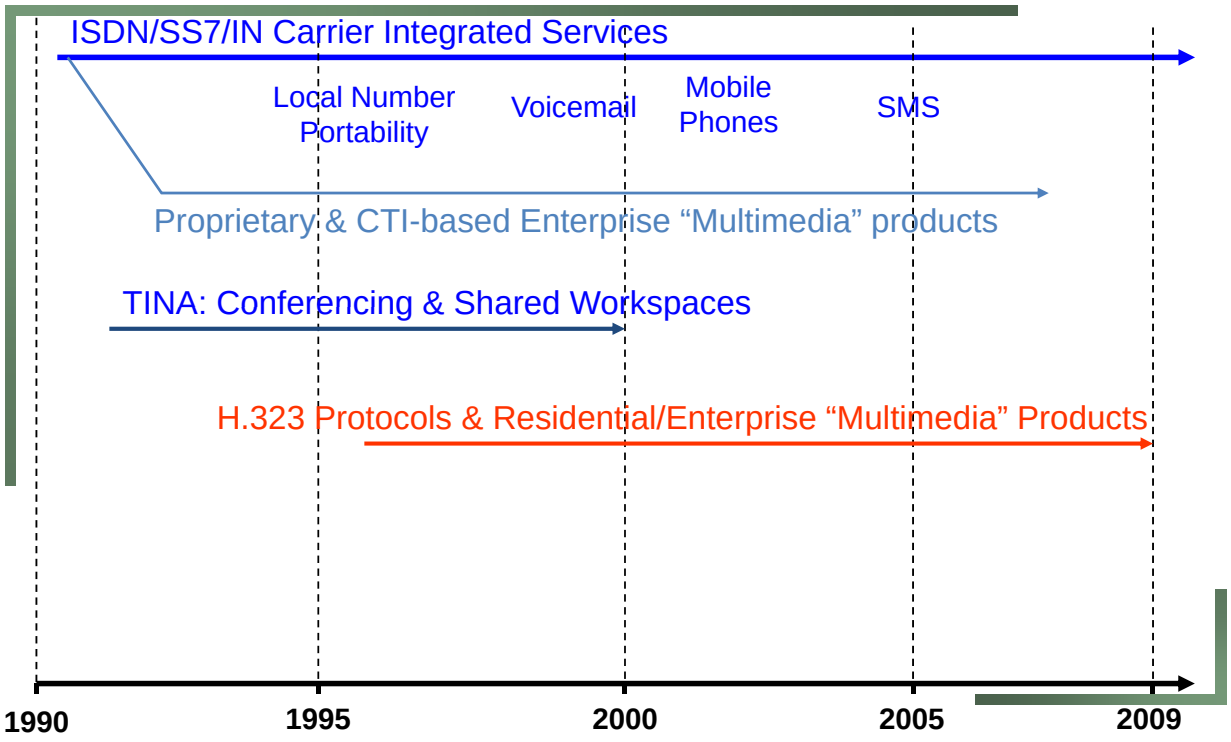
Evolutions of “Unified Comms” – Take 4



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1998

- The telecoms research communities were bewildered by
  - The WWW explosion
  - The uptake of H.323 across IP networks
  - The simplicity and effectiveness of Java as a platform for distributed service logic applications
- There was a gradual realisation that the middleware layer we'd been looking for to bridge between different telecoms networks was actually IP!!
- Traditional vendors and telcos rushed to protect their investments in ATM, defining and implementing IP/ATM bridges
- TINA-C, OpenSIG and CORBA gradually faded away
- 3gpp started looking at moving from an SS7 core network to an all-IP core network
- The Parlay group got started, extending TINA principles to define open APIs for 3PCC
- Telecoms organisations flooded into the IETF, to drive the improvements required to IP to truly support real-time voice and video apps

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Telecoms Research, 1999-2005

- Parlay, and later JAIN, spent time researching open APIs for 3PCC. Parlay focussed on CORBA and then WSDL, JAIN focussed on Java
- The telecoms research community spent years working with the IETF and IEEE, overhauling IP to be suitable for real-time telecoms. Efforts included improvements in the following areas:
  - Traffic shaping and congestion control
  - Network redundancy
  - Security
  - Traffic prioritisation and QoS schemes
  - Resource reservation
  - Power over Ethernet
  - Call control signalling & media negotiation protocols
  - DTMF and Fax relay
  - Network management & accounting
- Significant progress was made around converged mobile devices
  - Smart phones (Blackberry, BREW, Symbian, Android, Windows Mobile) & 3G mobile
  - Wi-Fi & WiMAX
- Interactive Voice Response (IVR) and Speech Recognition technology matured

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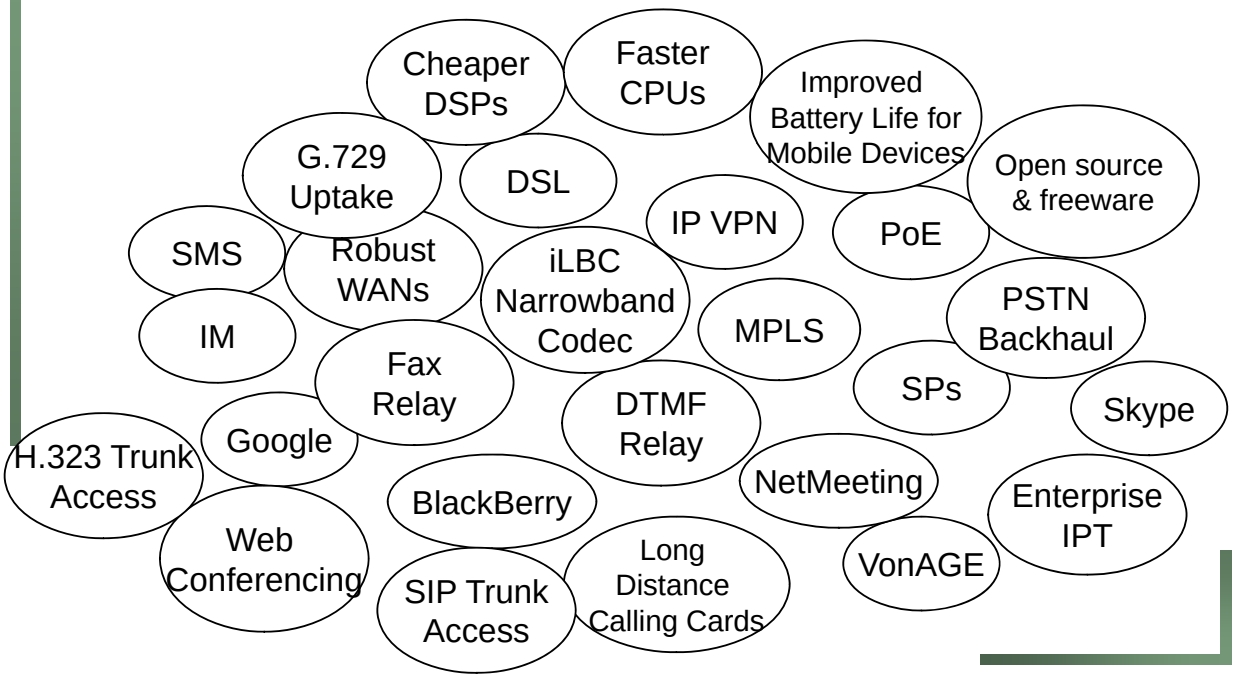
Real World Telecoms, 1999-2005



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"Unified Comms" – Take 5: '06 - ?

- The term "Unified Communications" emerged in 2006
- UC brings together Voice, Video, Data, Presence and Instant Messaging over IP networks
  - Video conferencing
  - Collaboration
  - Uses SIP for call control and 3PCC
  - Shared data include IMs, a shared view of documents and the ability to upload and download files within a session
- So what's new about UC?

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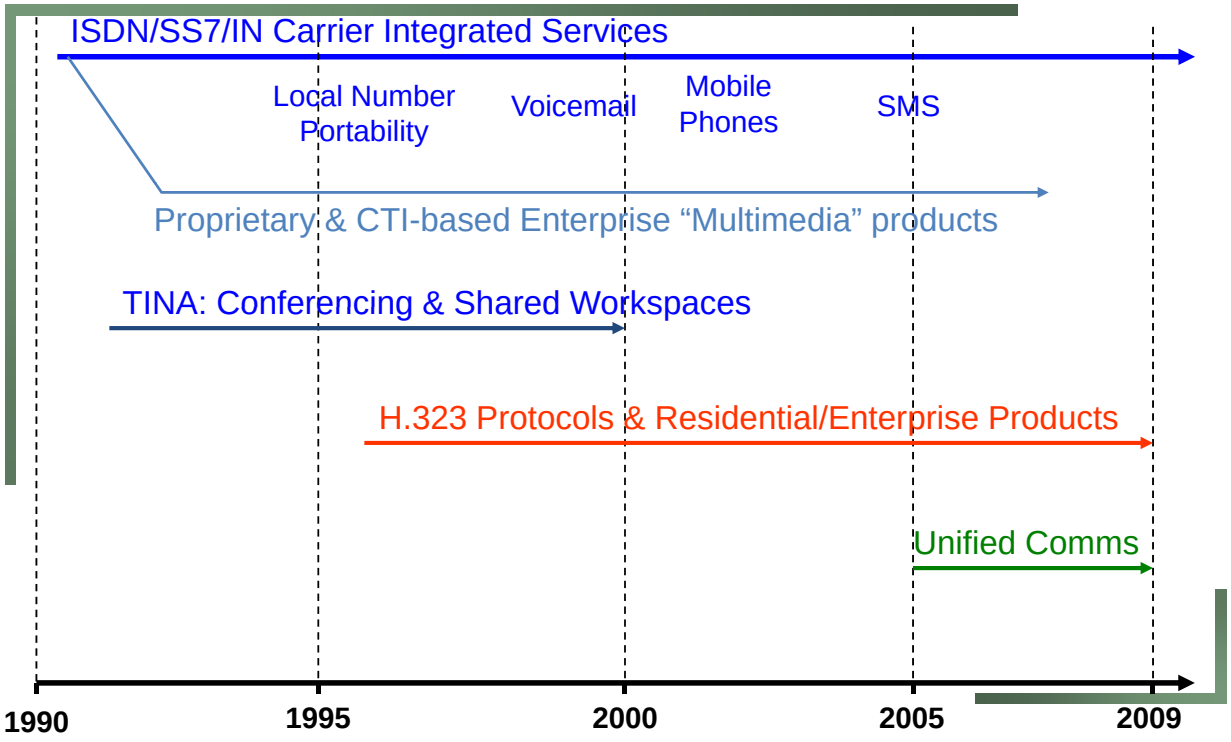
Evolutions of "Unified Comms" – Take 5



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So where were the real innovations towards Multimedia/UC?

- ISDN: Converging voice, video and data on the same line
- ISDN: Supporting intelligence in the end-user device

- IN: Centralised creation and rapid deployment of service logic

- TINA: Middleware as abstraction layer between network & applications
- TINA: Distributed application components with well-defined APIs
- TINA: Shared workspace – true data sharing..

- Parlay: Truly open APIs for 3rd Party Call Control

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So where were the real innovations towards Multimedia/UC?

- VocalTec: For putting voice over the internet
- ITU: For H.323, the first domain-spanning Call Control protocol for voice & video conferencing
- Sun: For Java, the first practical middleware for distributed applications
- Henning Schulzrinne: For MGCP & SIP - easy to use and suitable for both Call Control and 3rd Party Call Control
- RIM: For the BlackBerry
- Lots and lots of entrepreneurial organisations, for taking advantage of the new, open architectures and protocols by creating new and innovative business models

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So was it worth the wait?

- Yes!
- If TINA and/or B-ISDN had succeeded, broadband video conferencing and collaborative workspaces would have been available in 2000, but would have been **very expensive**, as the carriers would still have owned all the network & services infrastructure
- With multimedia & broadband technology converging on IP networks
  - It is now possible to build business cases to justify investing in the technology
    - The price of acquisition (CAPEX) has come down significantly
    - Cross-domain software/application integrations provide interesting new ways of doing business
  - Telecoms is now an open playing field, so the scope for new business models, applications and initiatives is **HUGE!!**
  - Every IS/IT department has effectively become a mini-carrier or Enterprise ICT Service Provider

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So Where To From Here? (Ideal World)

- Mobility
  - 4G Integration/convergence between mobile and wireless technologies, e.g. Wi-Fi, 3G, 2.5G, Wi-Max.
  - IPv6 addressing, voice & video QoS, security and handover
  - Being driven by ITU 3gpp, integrating IETF and IEEE technologies
- New Call Control, Media Control & 3PCC protocols, consolidating the best of H.323, SDP and SIP – H.325?
  - Being driven within ITU
- True convergence of voice, video & data with service architectures based on standardised APIs
  - Shared workspaces/whiteboards
  - Allow users to define and auto-deploy their own UC service logic & applications
  - Still needs a powerful, reliable middleware layer (current terms: SOA, SONA, Enterprise Service Bus, Cloud, etc etc)
  - Should draw from TINA & Parlay

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So Where To From Here? (Real World)

The major factors that will determine the progress of technology include

- Governments and how they legislate around
  - Licensing & regulation/de-regulation of “carrier” services
  - Criminal law, as applied to theft, damage and provision of content on-line
- Traditional carriers/service providers and how they build new pricing models, to pass on the cost of their infrastructure
  - There’s no such thing as a free lunch - or a free phone call!
- Product vs Service - the battle between the big IT vendors vs Cloud Service Providers
  - The vendors: Microsoft, Oracle, IBM, HP, Cisco, Apple
  - The Cloud Service Providers: Google, Yahoo!, SPs & ISPs
  - The in-betweeners: Citrix, BEA, Symantec, McAfee, Cisco, VMWare, Novell

Any questions?

For more information about how Innov8 can add value to your business, contact us..

Marcus Stock:

- Marcus.Stock@innov8.net.au
- (M) 0425 333 445

Dr. Fiona Lodge:

- Fiona.Lodge@innov8.net.au
- (M) 0413 227 287