

Convergence: One Network or Two?

Michael Bayer Jim Burton

Introductions



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Introductions



■ Michael Bayer

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 - Company dedicated to CTI Plug and Play
- ➤ Author, "CTI Solutions and Systems"
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Introductions



- Who are you?
 - > Vendors?
 - ➤ Integrators, Interconnects, and Resellers?
 - > Customers?
- When do you think you will have a single network?
 - ➤ This year?
 - ➤ Next year?
 - ➤ Within 5 years?
 - ➤ Never?

One Network or Two?



- Not if,
- But:
 - ➤ What?
 - ➤ Why?
 - ➤ When?
 - ➤ How?

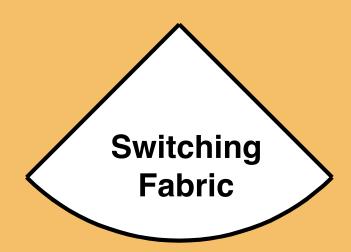


What

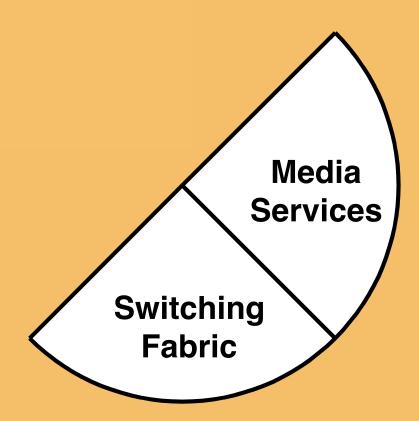
What do you need to know?



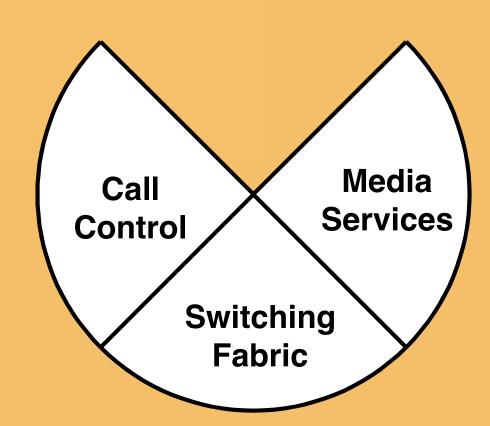




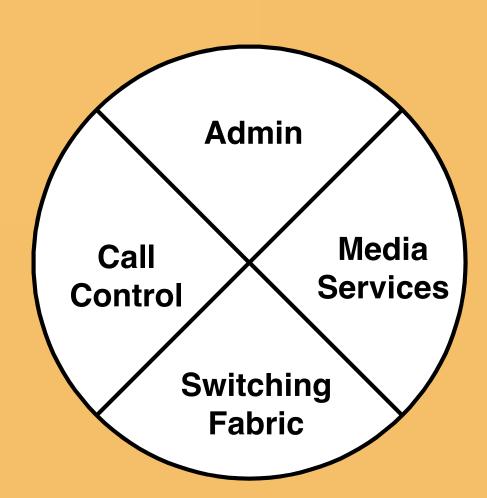








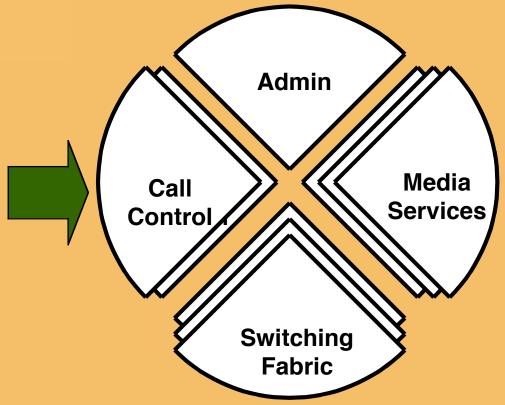




Computer Telephony Revolution



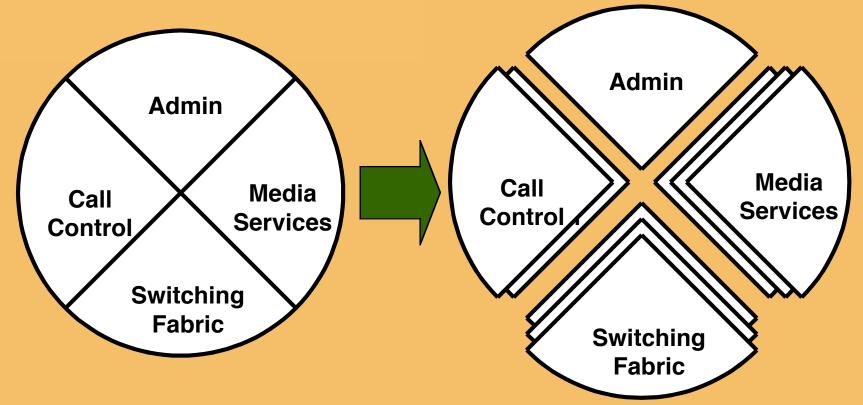
- Using off-the-shelf computer technologies to implement telephone system components
- Shift from Monolithic to Modular systems



Computer Telephony Revolution



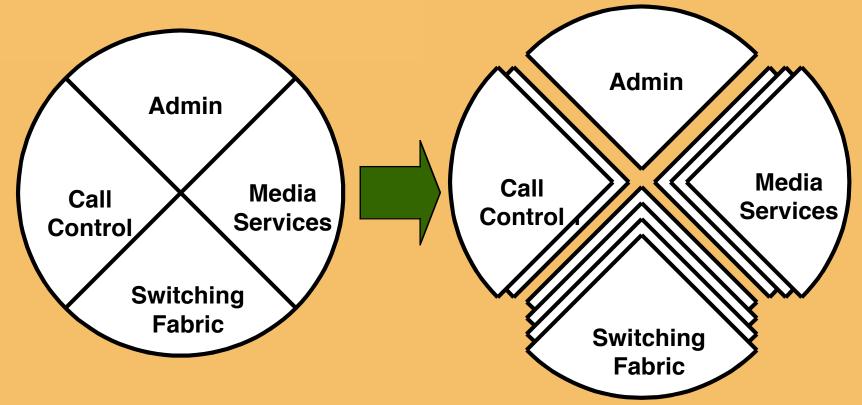
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Computer Telephony Revolution



- Using off-the-shelf computer technologies to implement telephone system components
- Shift from Monolithic to Modular systems



CTI / Call Control



Call Control

- Monitoring and directing calls in a telephone system
- Telephone Control
 - ➤ Monitoring and controlling features of a telephone set
- Media Binding
 - ➤ Relating other communications/telephony functionality to calls in a telephone system

CT Media Access/Services



- Tone Detection and Generation
- Recording and Playback
- Text-to-Speech
- Speech Recognition
- Modulated Data (Modem/Fax)
- Digital Data (Compressed Video, etc.)
- Call Binding

Admin



- System configuration
 - ➤ System customization
 - ➤ Moves / Adds / Changes
- Fault monitoring
- Accounting
- Performance management
- Security

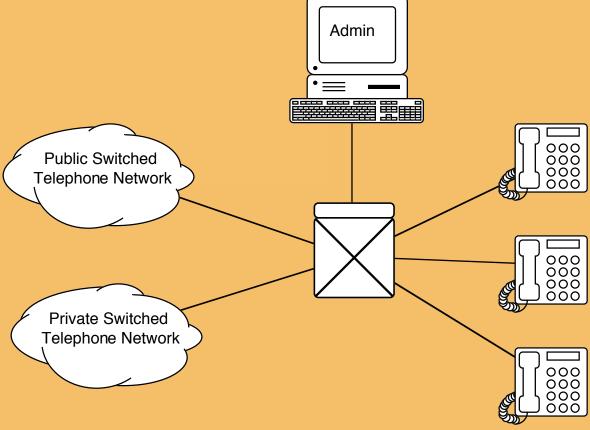
Switching Fabric



- Establishes media stream channels between endpoints and conveys signaling information
- Traditional Switching Fabric
 - ➤ TDM bus backplanes connecting line cards
 - Analog (POTS) and digital (T-1, ISDN, proprietary) telephony circuits
- IP Telephony Switching Fabric
 - ➤ Packetized voice over conventional IP networking infrastructure
 - ➤ Typically based on off-the-shelf computer technology
- Other Hybrids

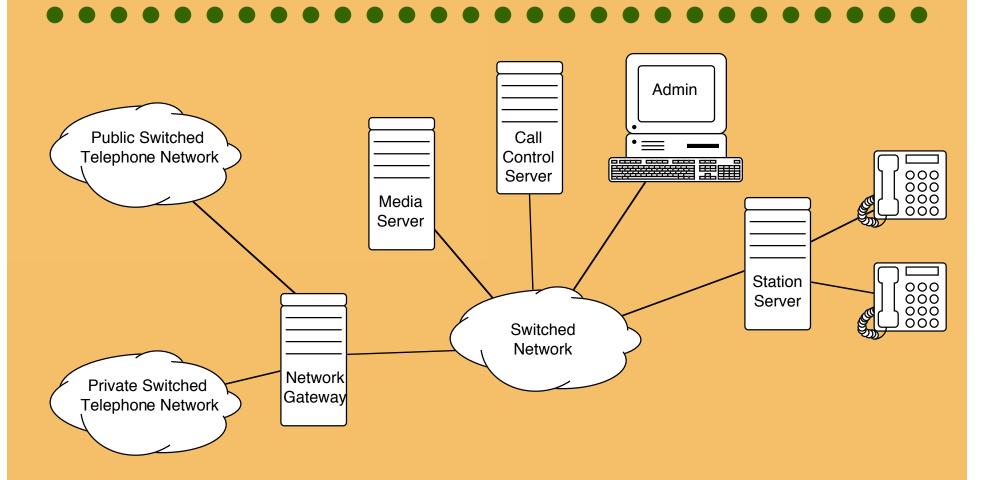






Distributed PBX Architecture



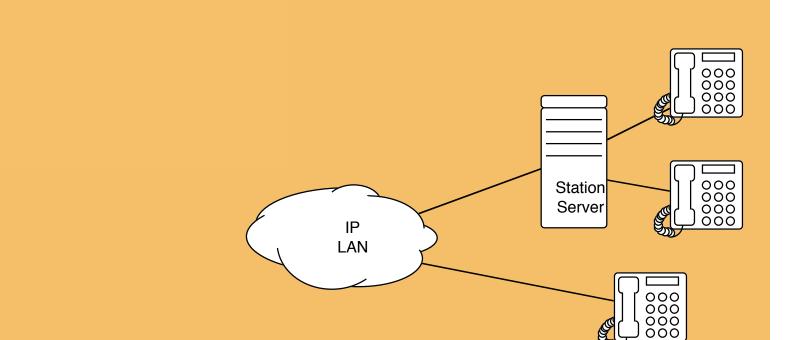




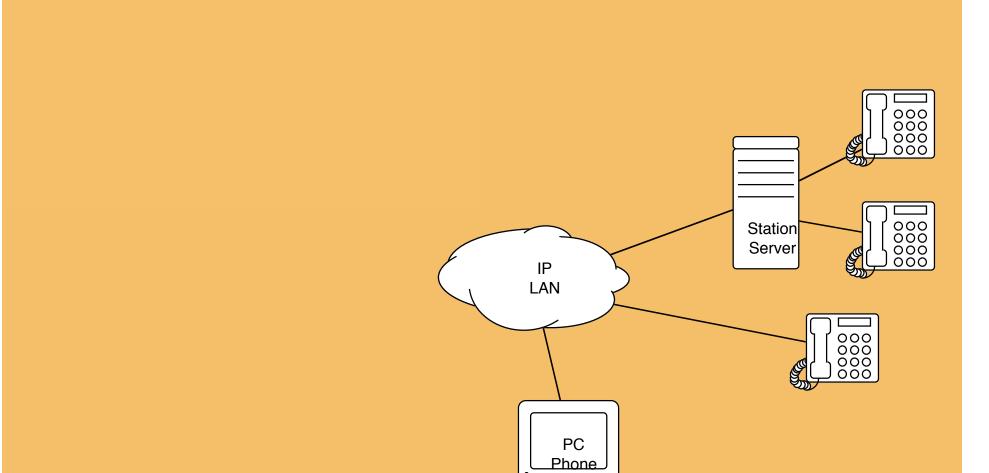




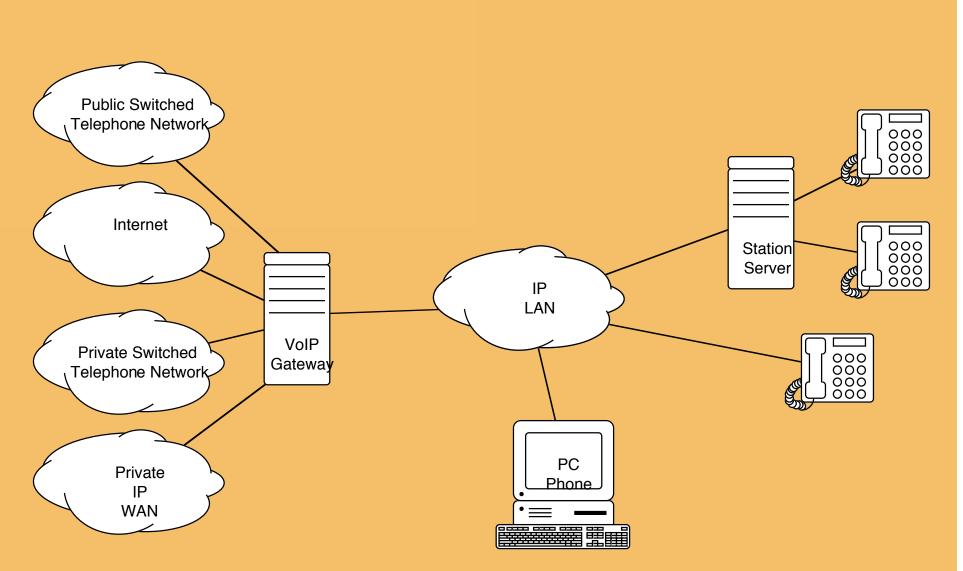




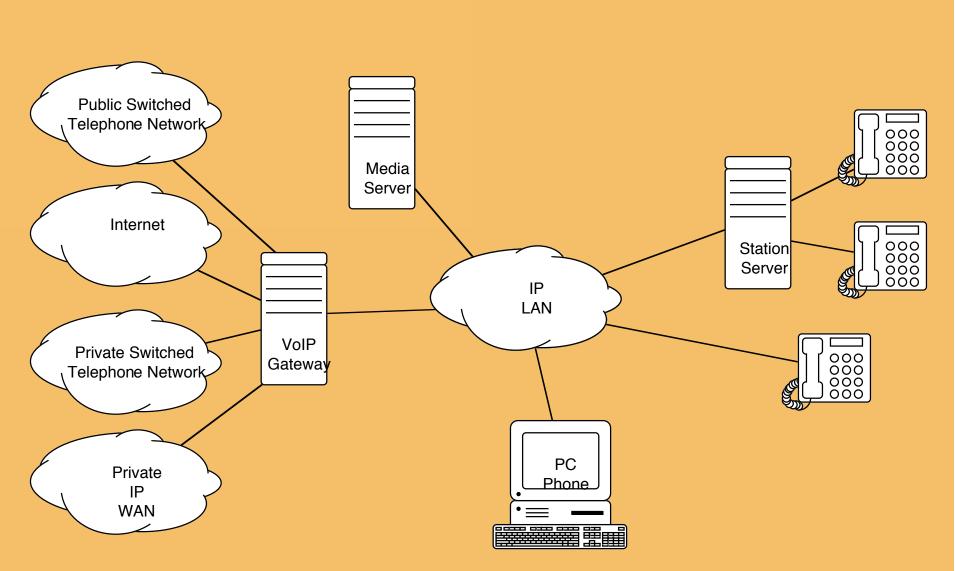




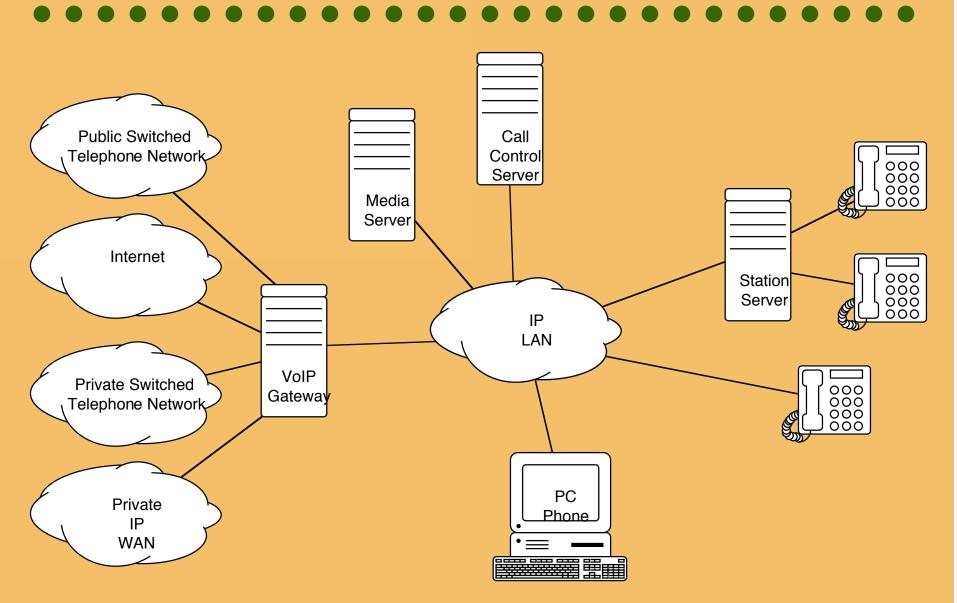




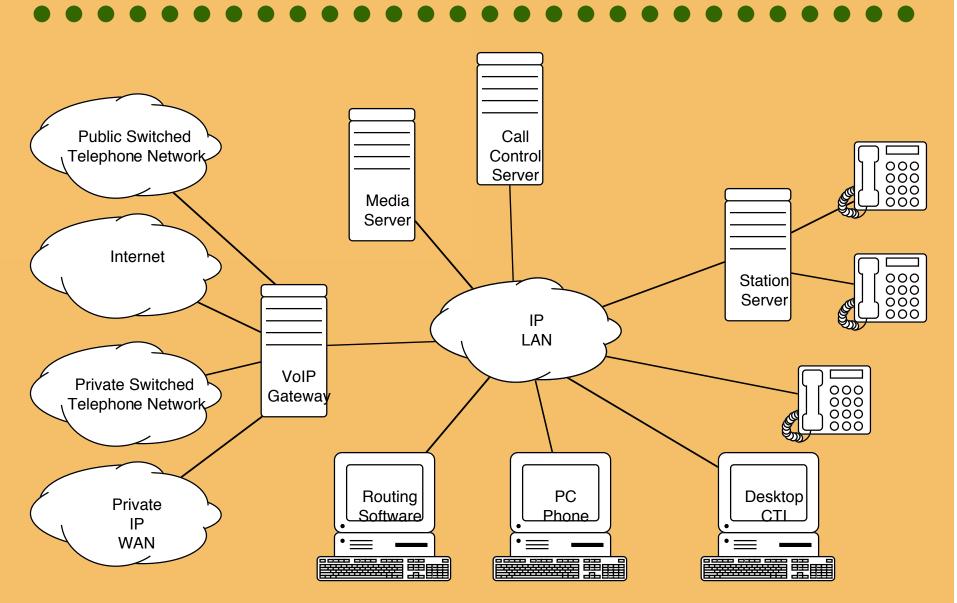




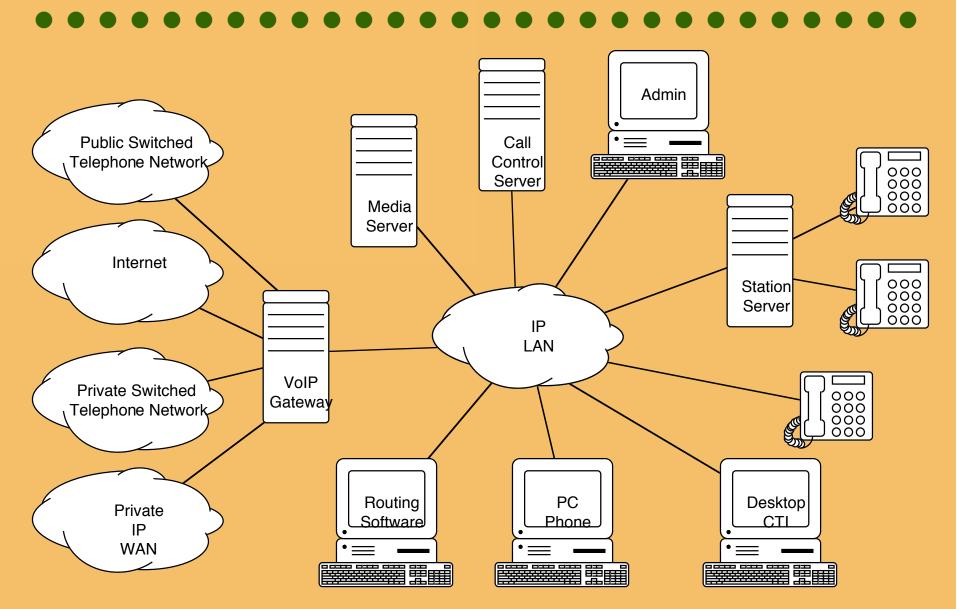




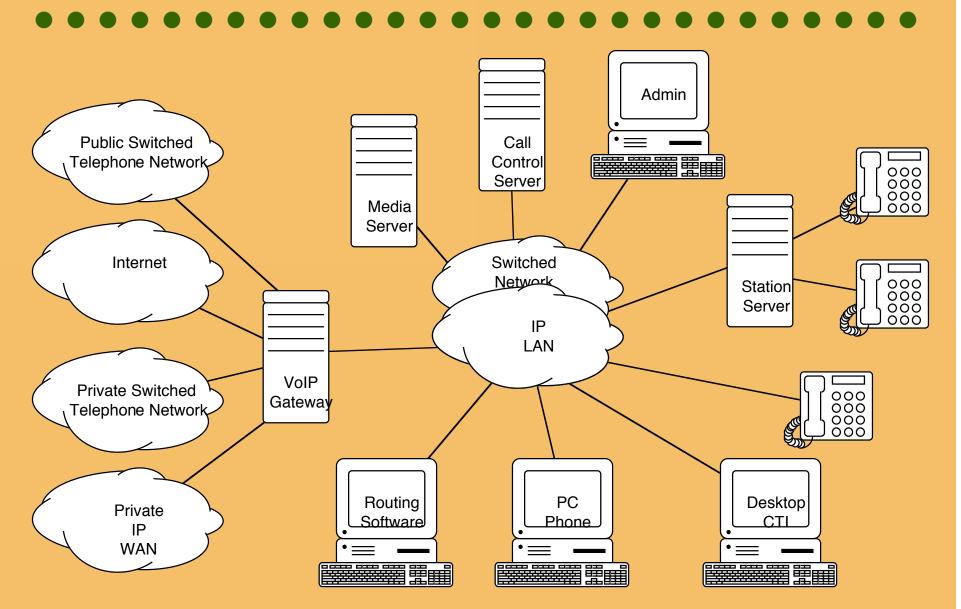




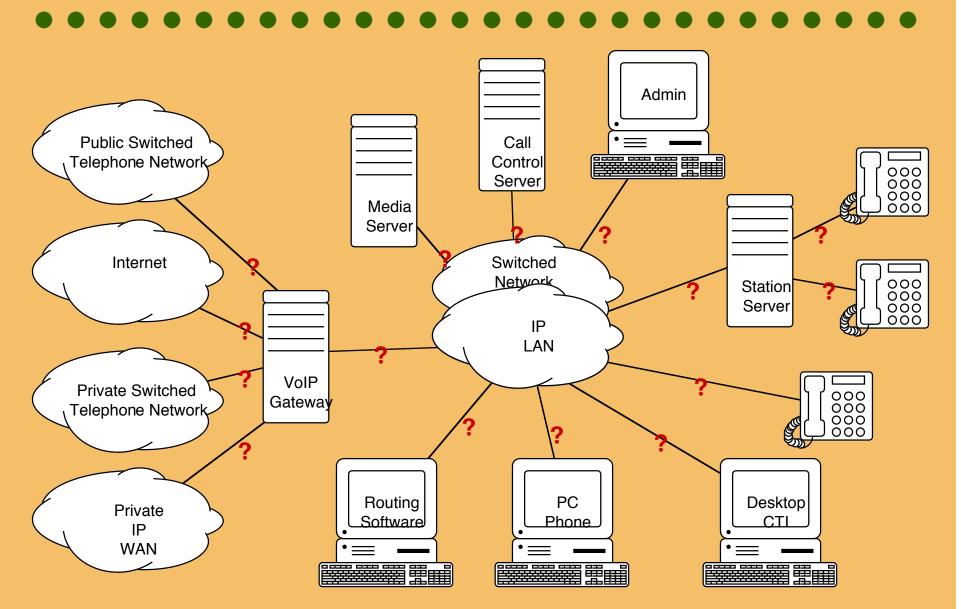




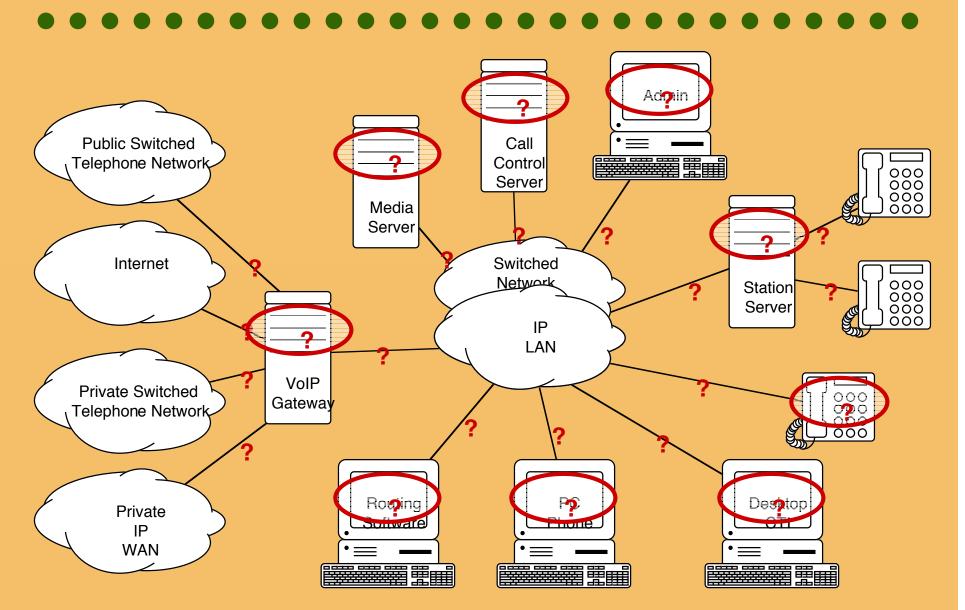






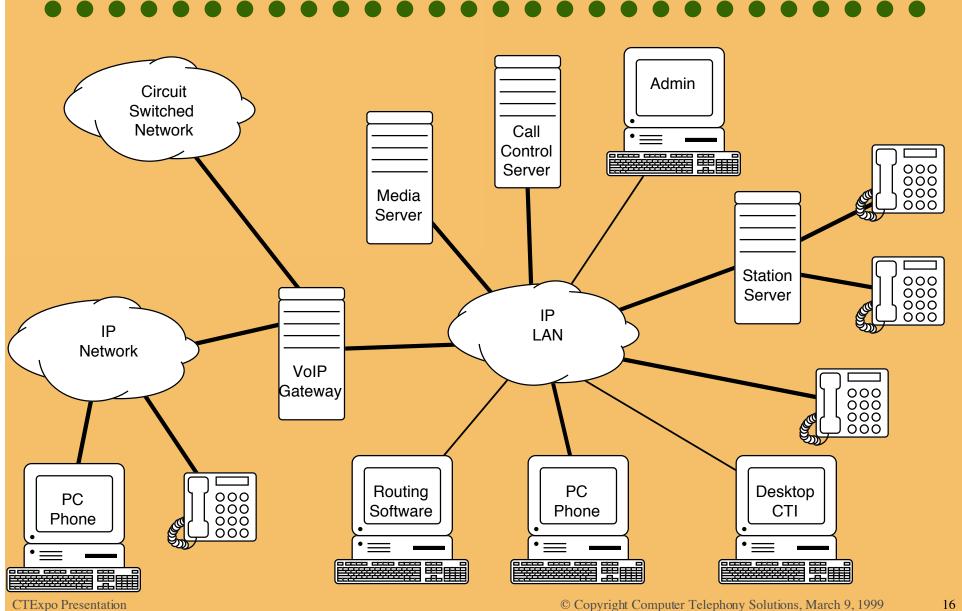






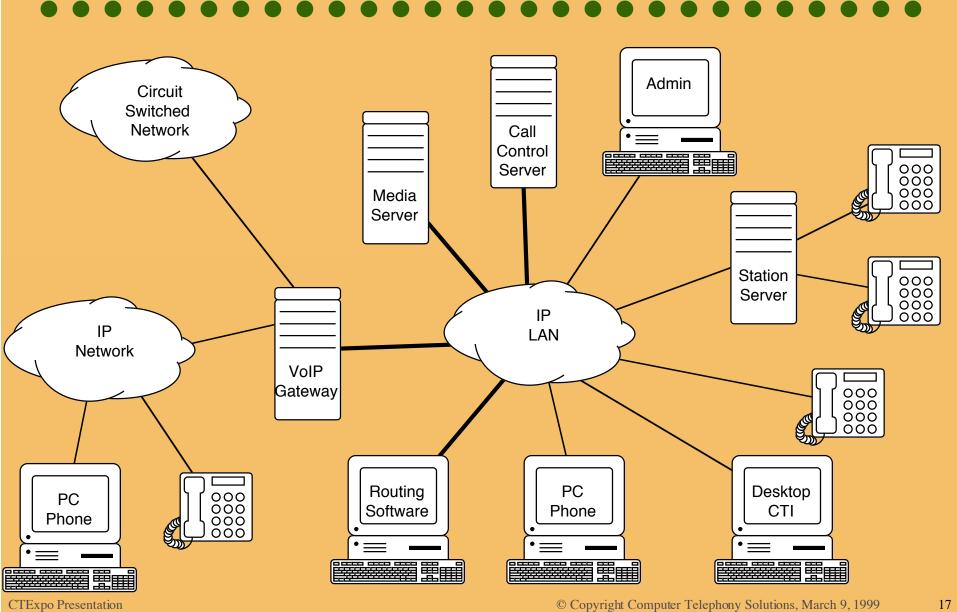
Switching





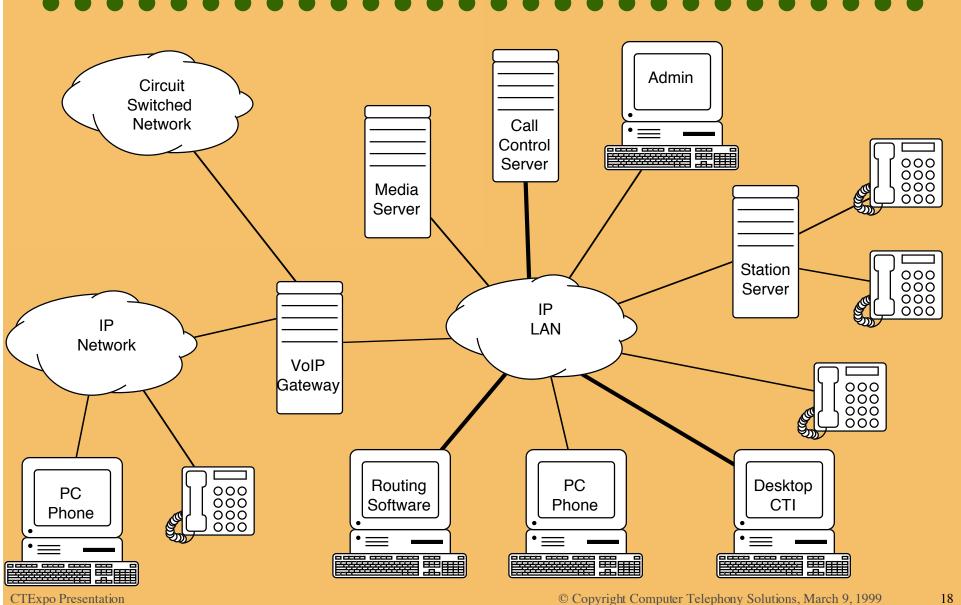
Media Services





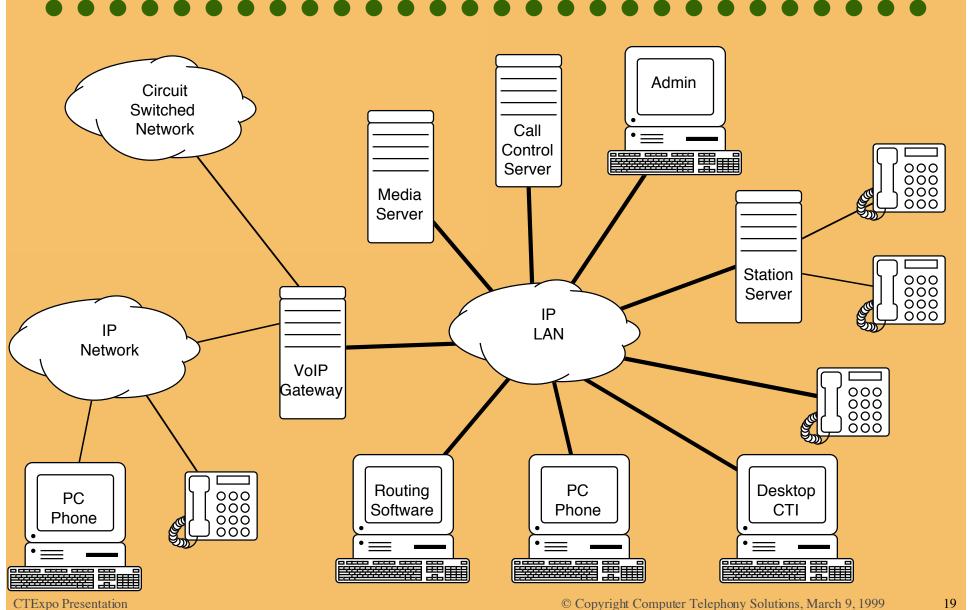
CTI / Call Control





Administrative Services







Who and Why

Why should anyone be interested?

Motivation for Single Network



Engineering

- ➤ Because we can?
- ➤ More elegant?

Economics

- ➤ Cheaper to Install?
- ➤ Cheaper to Maintain?

Applications

- ➤ New capabilities?
- ➤ New flexibility?

The Promise of CT Technology



Telephone systems

that are

tailored

to the

specific needs and preferences of users

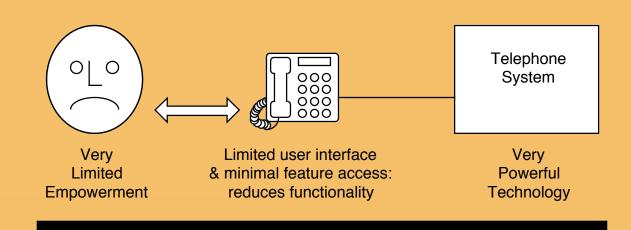






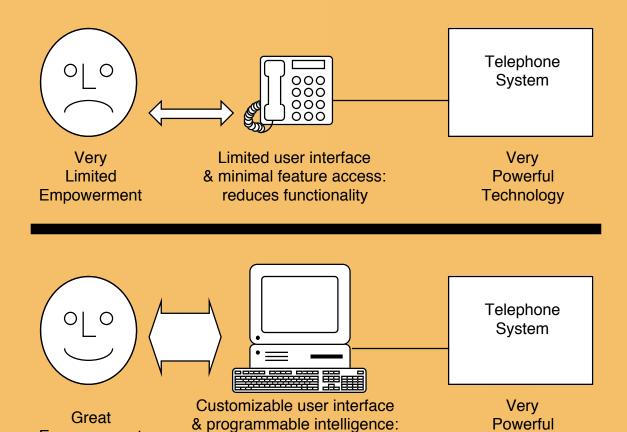






Empowerment





amplifies functionality

Technology

Value Chain

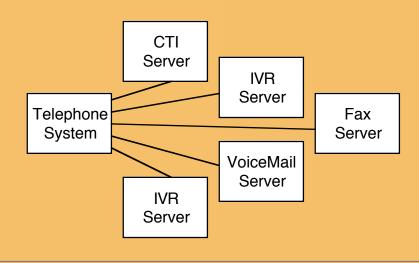


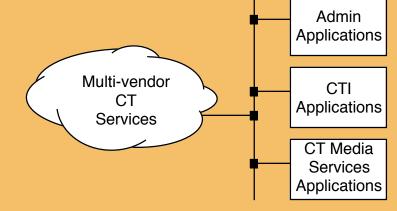
Callers Individuals **CTI System Customers** CTI System Integrators Mainstream Application Developers **Telephony Software Developers Operating System Vendors** Computer Hardware Vendors Telephone Equipment Vendors **Telephone Network Providers**

Customer Requirements



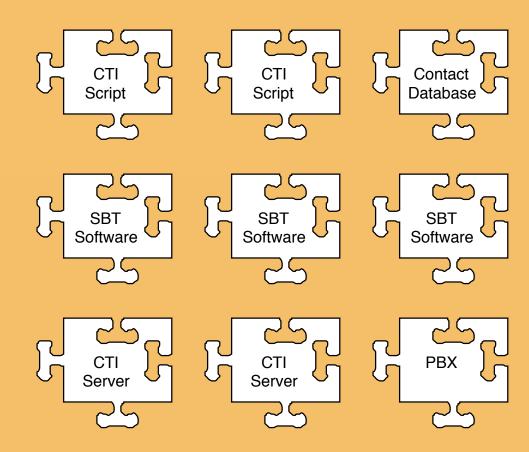






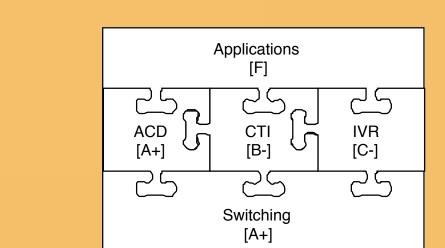
Integrator's Point of View

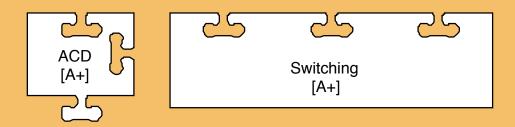


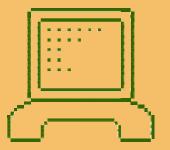


Vendor's Point of View









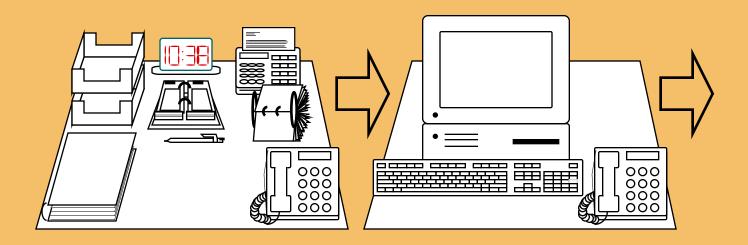
When

When will it be ready?

It's Inevitable...

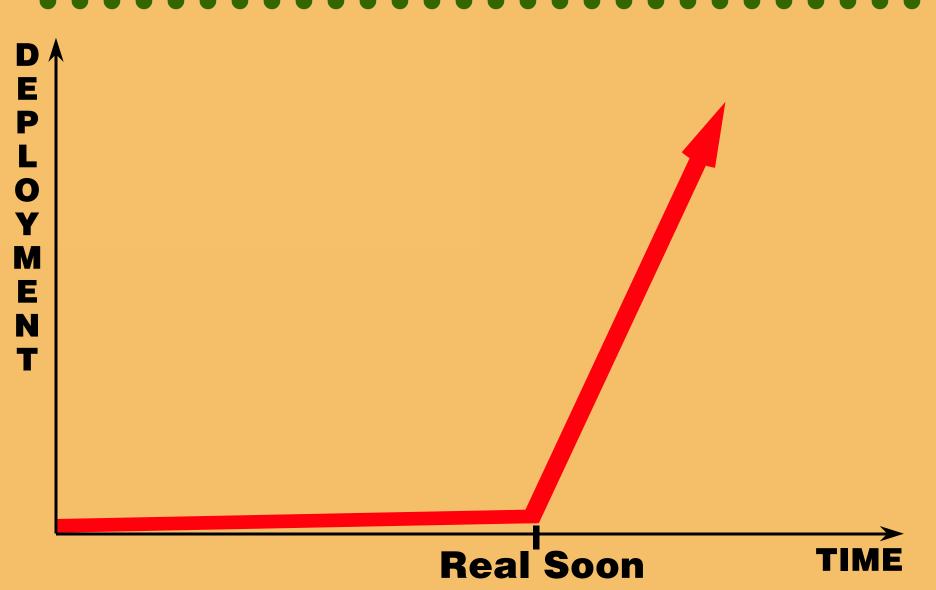


- **■** The Computer
 - ➤ the new desktop
- The Telephone
 - > the most ubiquitous appliance in the world



Any day CT will take off...





What went wrong?



- The promise of CT/CTI is custom, modular solutions
- The lack of interoperability between products limits or prevents customization
- Standards and other interoperability specifications allow for modular systems
- Modularity is a measure of product maturity
- The competition is the status quo

Product Maturity



Interoperability

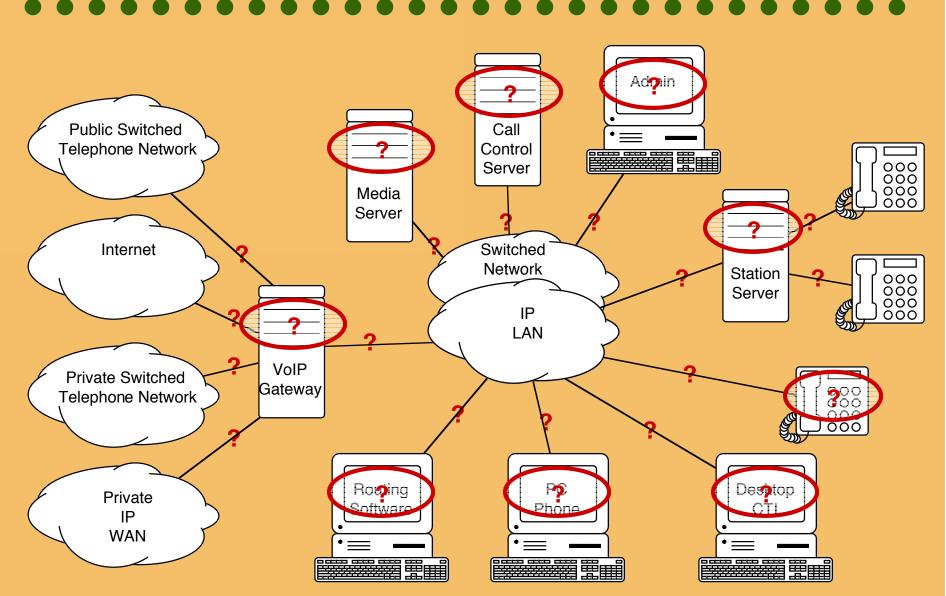
➤ Standards and other interoperability specifications allow for modular systems

Capabilities

 New products must be functionally competitive with existing products

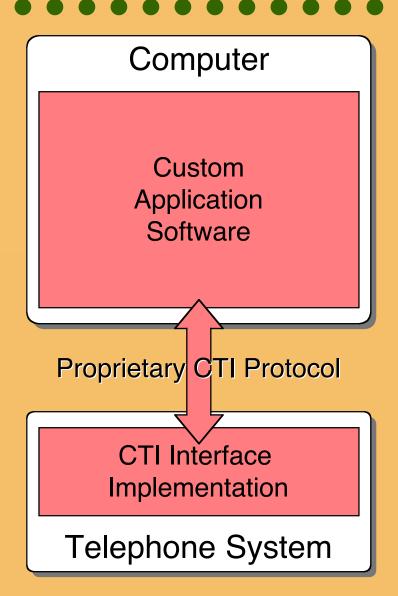
Telephone System Implementation





First Phase of CTI: Custom Systems





Second Phase of CTI: APIs





Application Software

CTI API

Proprietary CTI Protocol Software

Proprietary CTI Protocol

CTI Interface Implementation

Telephone System

Third Phase of CTI: CTI Protocols



Computer

Application Software

CTI API

Standard CTI Protocol Software

Standard CTI Protocol

CTI Interface Implementation

Telephone System





Server



Server

Core Server Implementation



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Server

Core Server Implementation

Service Provider Interface(s)





Server

Core Server Implementation

Service Provider Interface(s)

CT Resource Modules



Server

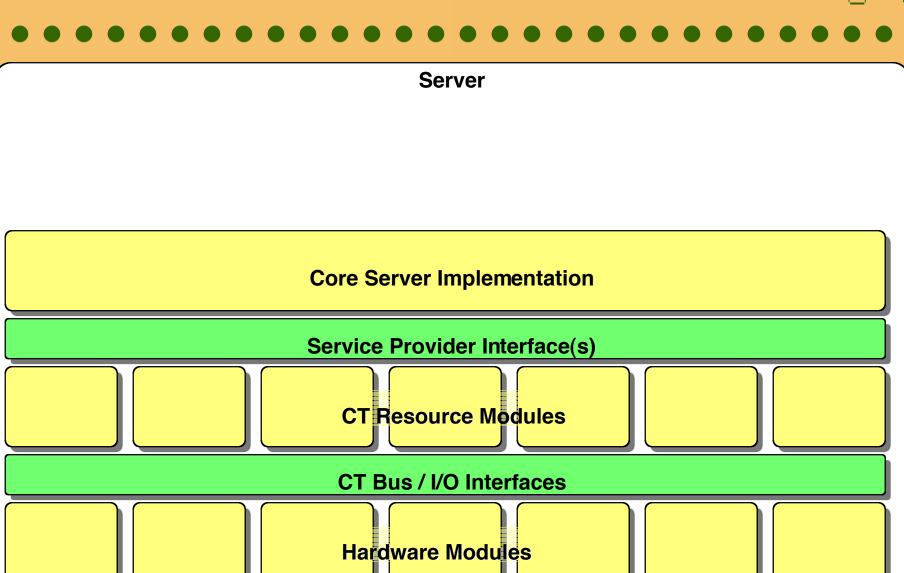
Core Server Implementation

Service Provider Interface(s)

CT Resource Modules

CT Bus / I/O Interfaces

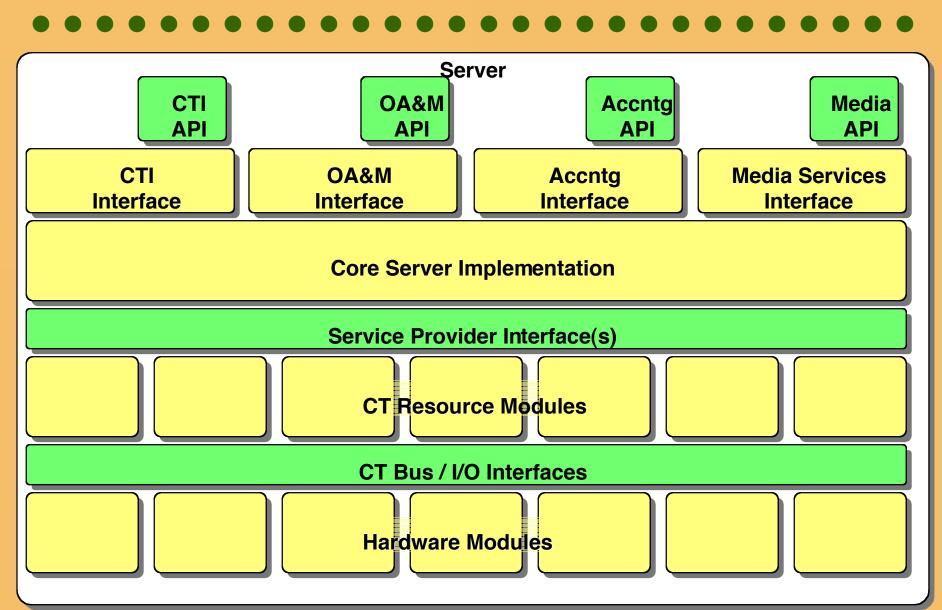




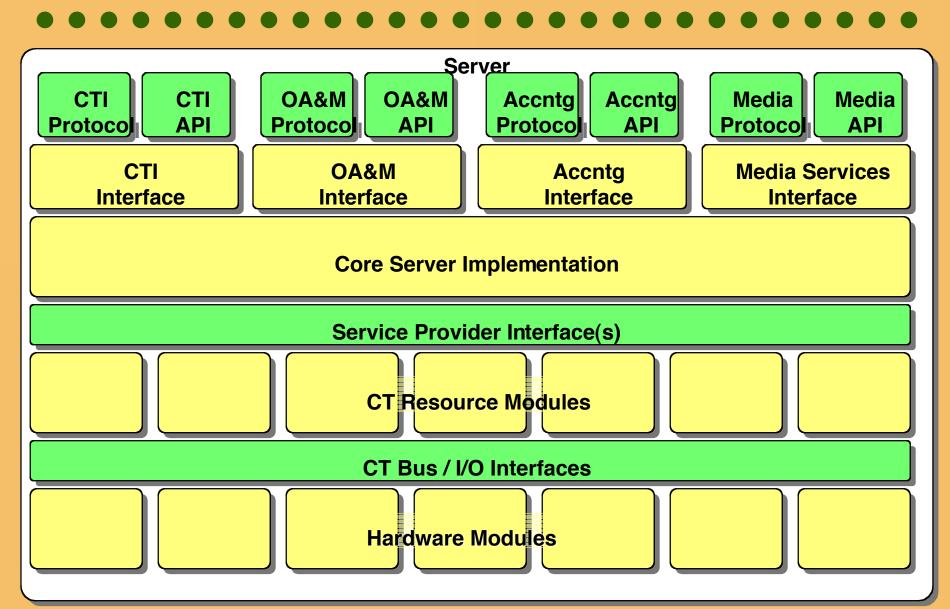


Server **Accntg** CTI OA&M **Media Services Interface Interface** Interface Interface **Core Server Implementation Service Provider Interface(s) CT Resource Modules** CT Bus / I/O Interfaces **Hardware Modules**









Specifications and Standards

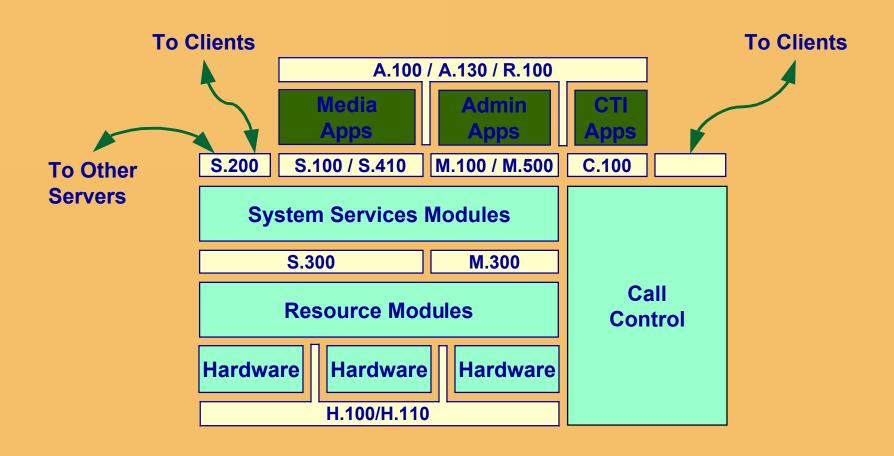


- Standards Bodies
 - ➤ ITU
 - ➤ ANSI
- Individual Vendors
 - ➤ Microsoft
 - ➤ Lucent/Novell
 - ➤ Sun
- Industry Organizations
 - > IETF
 - ➤ ECTF

ECTF Framework

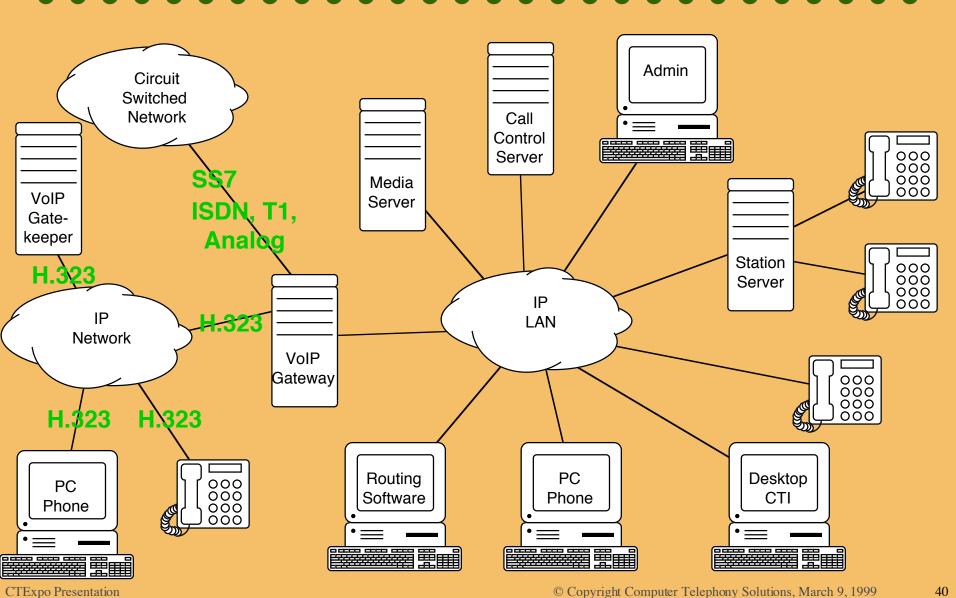






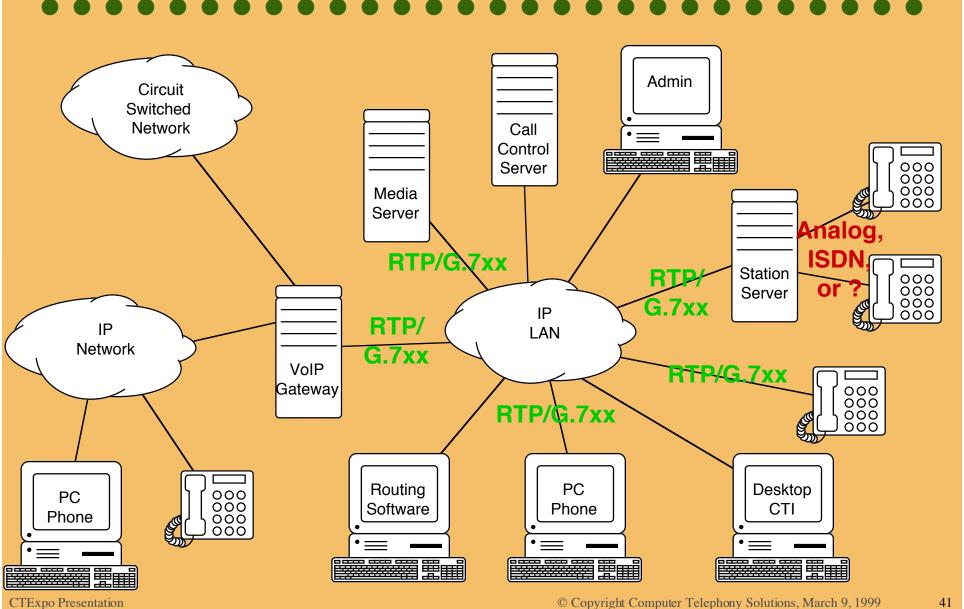
Public Network Switching/Signaling





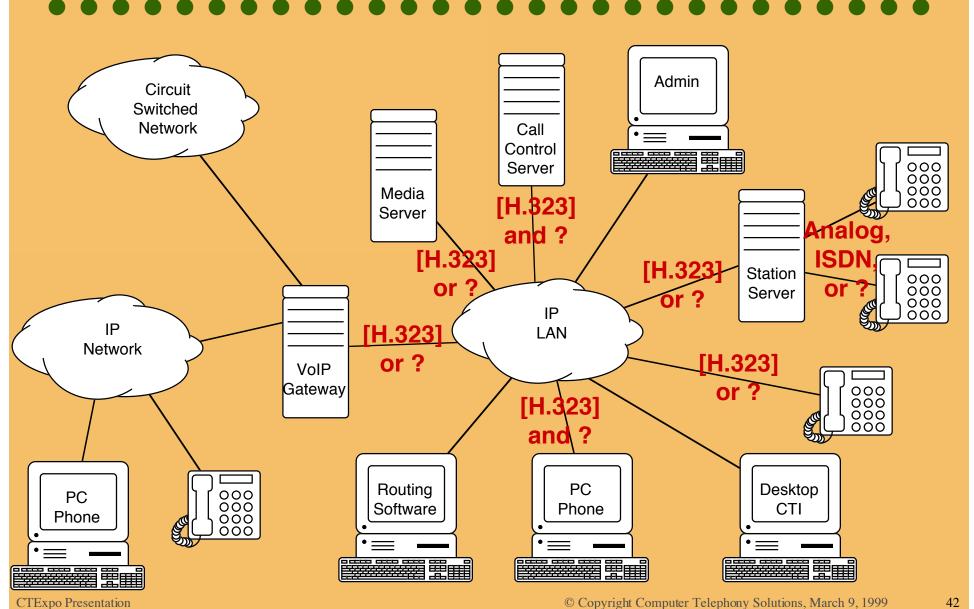
Switching: Media Streams





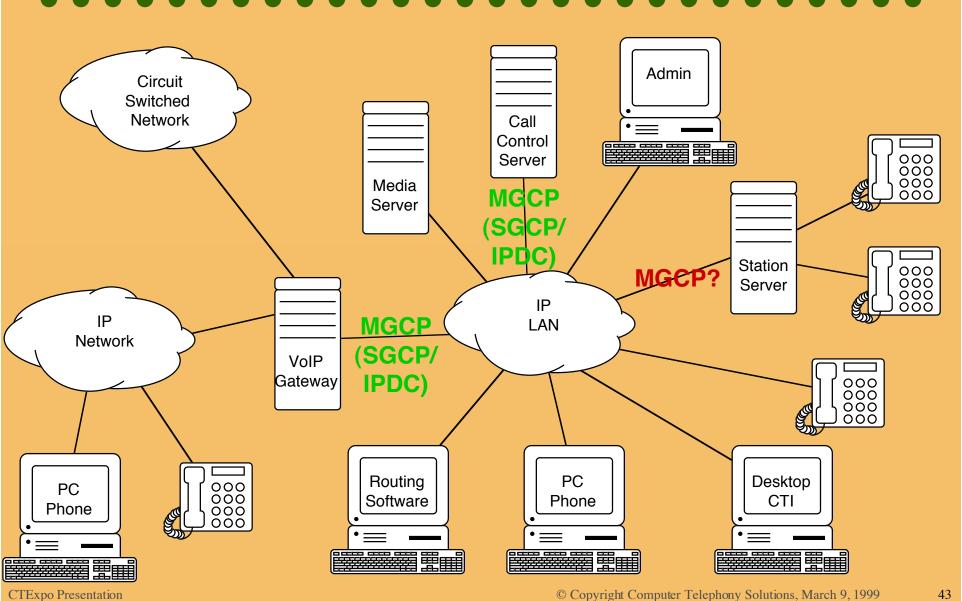
Switching: Signaling





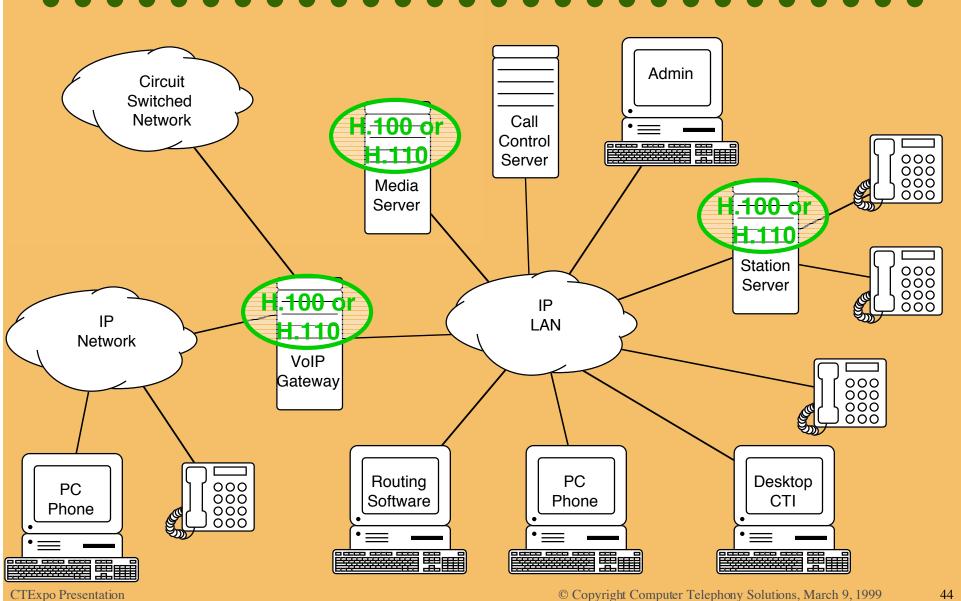
Switching Fabric Control





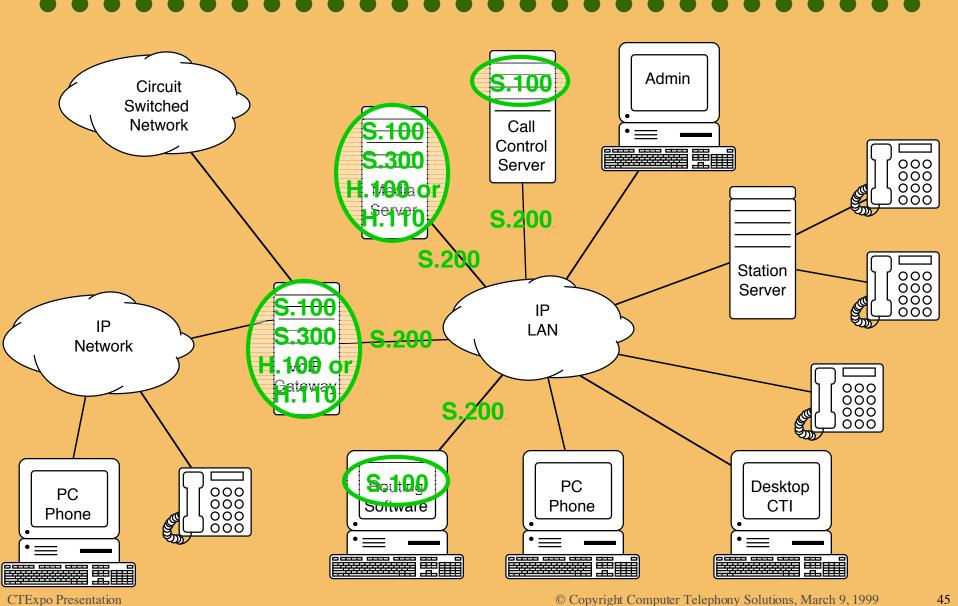
Switching Fabric: TDM Bus





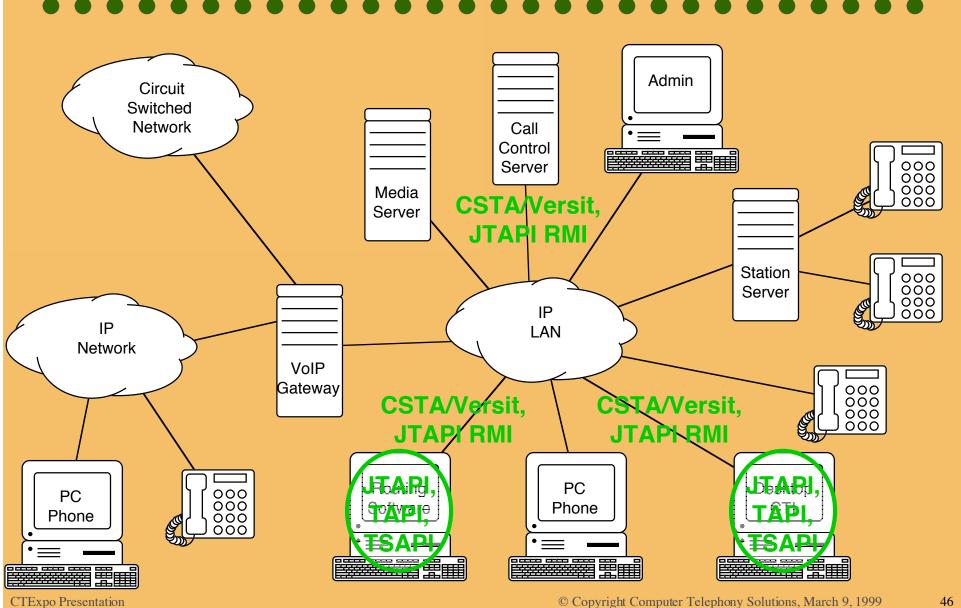
Media Services





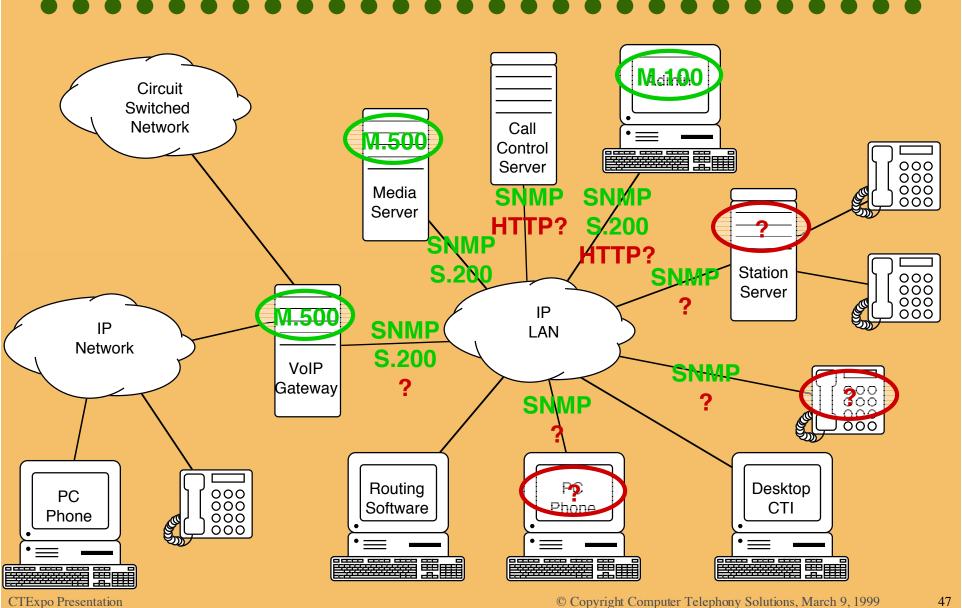
CTI / Call Control

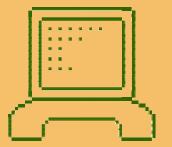




Administrative Services







How

How should you decide?

Know Your Requirements



- Don't take anything for granted
- What do you have that you don't really need?
- What do you need?
- If it ain't broke don't fix it

Don't take things for granted



- Security
- Class of Service
- Quality of Service
- **911**
- Blocking
- Forwarding
- Wireless
- CTI Applications
- Media Services Applications
- Platform Independence

Know your priorities



- Where do you stand to gain the most benefit?
 - ➤ CTI Applications?
 - Media Services Applications?
 - ➤ Admin?
 - ➤ Switching Fabric?
- Don't make any assumptions
 - ➤ IP Telephony is just a new switching fabric

Maturity Checklist



- Framework
 - > ECTF
- Call Model
 - ➤ C.001
- Published APIs / Multi-platform
 - ➤ TAPI, TSAPI, JTAPI, S.100, M.100
- Open Protocols
 - ➤ H.323, MGCP, Versit/CSTA, S.200
- Plug & Play Products

What should you be doing?



Get tough with vendors

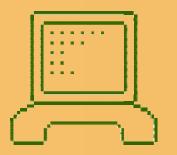
- ➤ Get "Questions for Vendors" from ECTF (booth #247)
- ➤ Encourage vendors to implement and ship products based on specifications (not just to talk about it)

■ Think modular

- ➤ Shop for components
- Support manageable diversity
- ➤ Build in a modular fashion by taking advantage of interoperability specifications wherever possible

■ Don't rush

➤ If appropriate, defer purchases or invest in products that will help you migrate over time



Q&A