Telecom Trends

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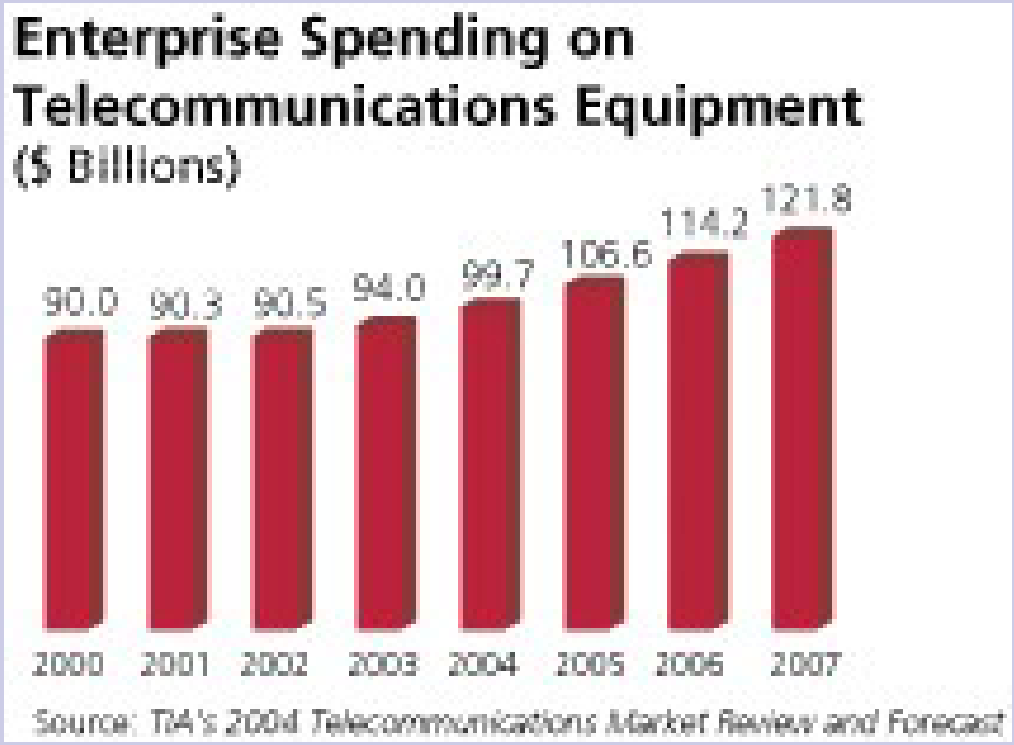
Session Objectives

- Review of current telecom news and trends
- VoIP
  - Trends
  - Key Advantages
  - Implementations & Concerns
  - Emergency services
  - Wireless
  - Multimedia Reservation Centers
- Cell Phones
- Call Accounting

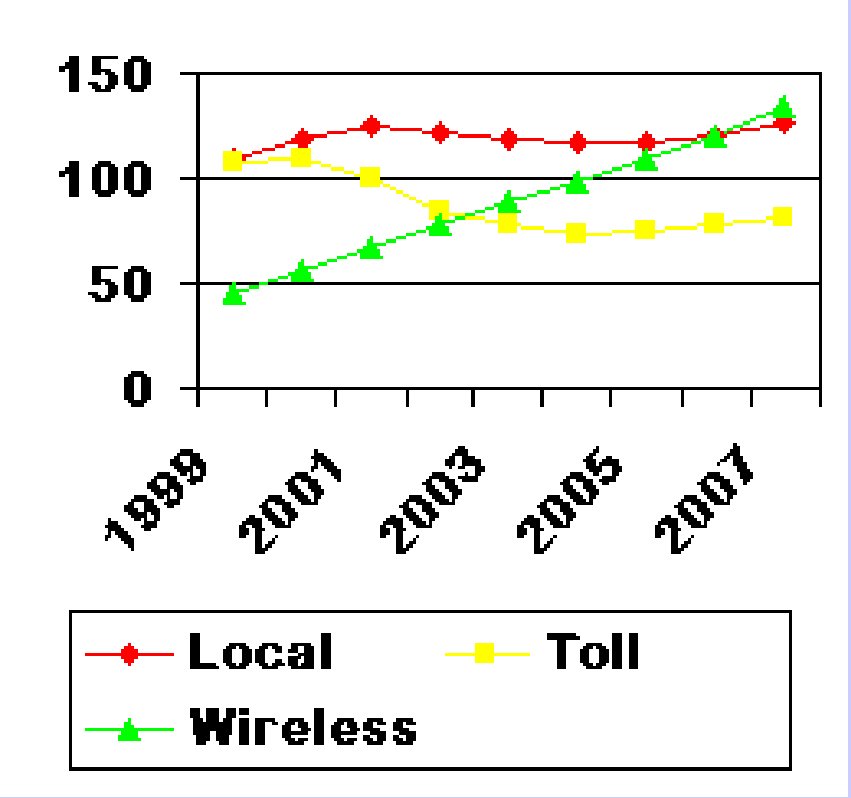
Telecommunications Industry Association's (TIA) Telecom Market Forecast

- IP traffic is growing at > 70% annually
- Revenues for IP applications services, such as Web conferencing - growing even faster
- IP-PBX line shipments are expected to grow 35 percent in 2004 to 2 million lines.



What about Wireless?

- Fastest growing segment of the industry.
- Spending on Wireless Services Surpasses Long-Distance Services Spending.
- Wireless services projected to reach $99 billion in 2004.
- Shift to wireless services reflects a transformation in residential telephone service pricing.
  - Flat-rate pricing has proved appealing to consumers.
  - Providers are striving to offer attractive packages of bundled local and long-distance services.



Wireless effect on the Carriers?

- *Reported March 8th, 2004:*
  Matthew J. Flannigan, TIA president:
  - "In the next few years, per-minute charges for long-distance calls will probably disappear, and the distinction between local and long-distance will become less meaningful,"
  - "In fact, carriers hope to limit defections to wireless services by bundling landline local/long-distance services with high-speed Internet access and television programming.“

  Basically a move to the “convergence of services”

- This is already evident by some of the cable companies providing all of these services

Telecom Carrier Trends

- Moving away from earning large majority of money on a per call basis
- Now offering packaged “unlimited” calling plans
- Large focus on providing digital circuits to businesses
- VoIP & HSIA placing large demand on T1 circuits
- As more VoIP systems are installed, the demand for regular trunking is being reduced
- Most of the major carriers have announced plans to enter the VoIP market e.g. AT&T to offering “Call Vantage” in over 100 locations by end of year
  - $34.95 / Month unlimited calls
  - 6 month introductory offer of $19.95
- Note VoIP is NOT regulated!

Telecom Carriers – Latest Court Ruling

- June 9th, 2004 the Administration declined to intervene in an appeals court ruling gutting the local-service leasing requirements
- Appeals court courts do not want to enforce requirement that the Regional Bell Companies (RBOCs) have to lease out space to other competitors at reduced rates.
- Consequently AT&T, MCI and other carriers will have a difficult time competing with the Bell Companies for local services.
- Bell companies promised not to raise rates until next year
- Expect to see pricing for local services level off – at least in the immediate future

Telecom Carriers – New product offerings

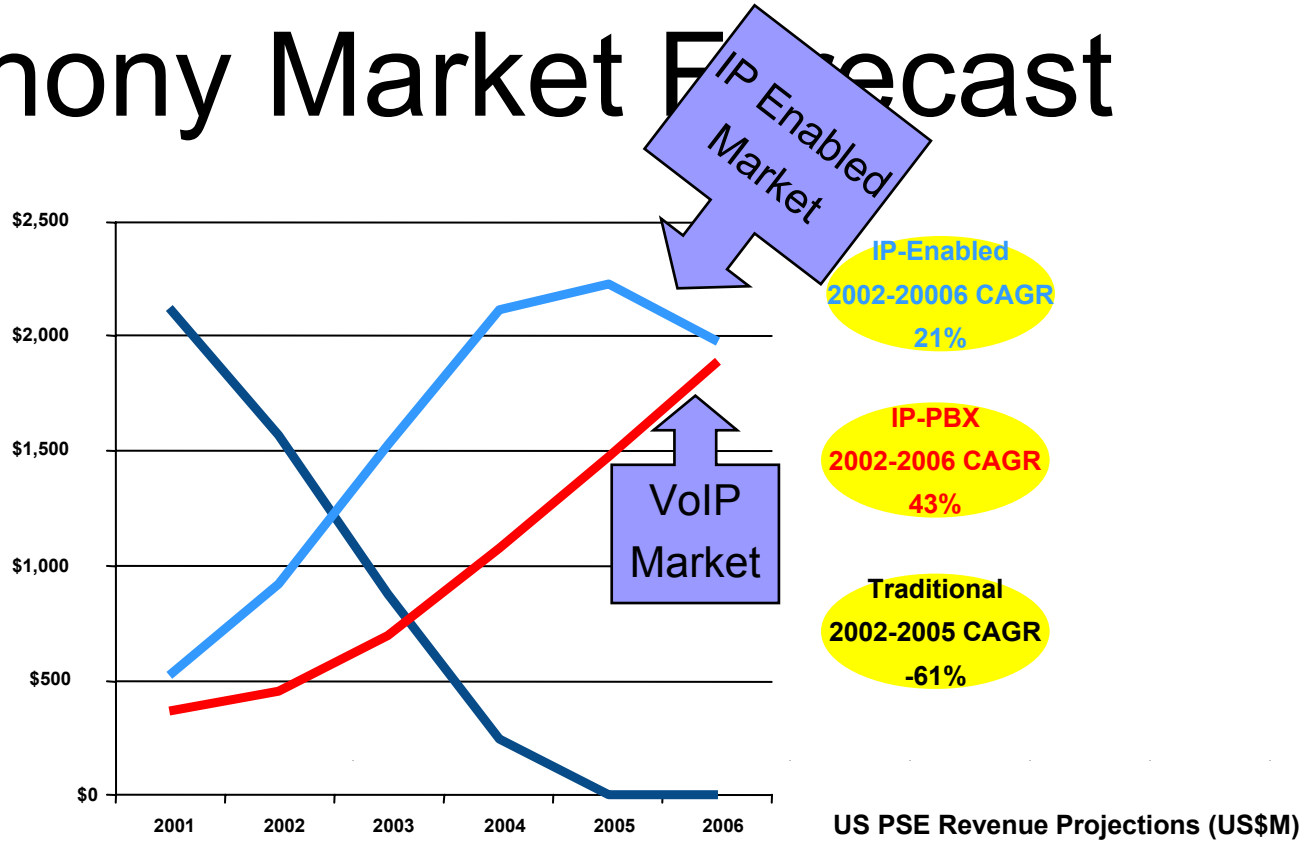
- Fiber products – tailored to provide small to large provisioning of services

- GigaMAN is a point-to-point, full duplex service.
  - GigaMAN will operates at the maximum distance allowed based on facilities availability and network capabilities.
  - Ethernet Dedicated Internet Access is available in increments of 5Mbps, between a minimum of 40Mbps and a maximum of 1Gbps.
  - A burstable option is also available to give full circuit capacity on demand, at a cost based on normal period average usage.

- Burstable DS1 & DS3
  - Work similarly to the dedicated versions of these products.
  - The real difference is the way they are billed. Provider monitors the line and takes samples of the bandwidth usage every 15 minutes. At the end of the month, all of the data points are charted on a graph

VoIP Update

Telephony Market Forecast



US PSE Revenue Projections (US$M)

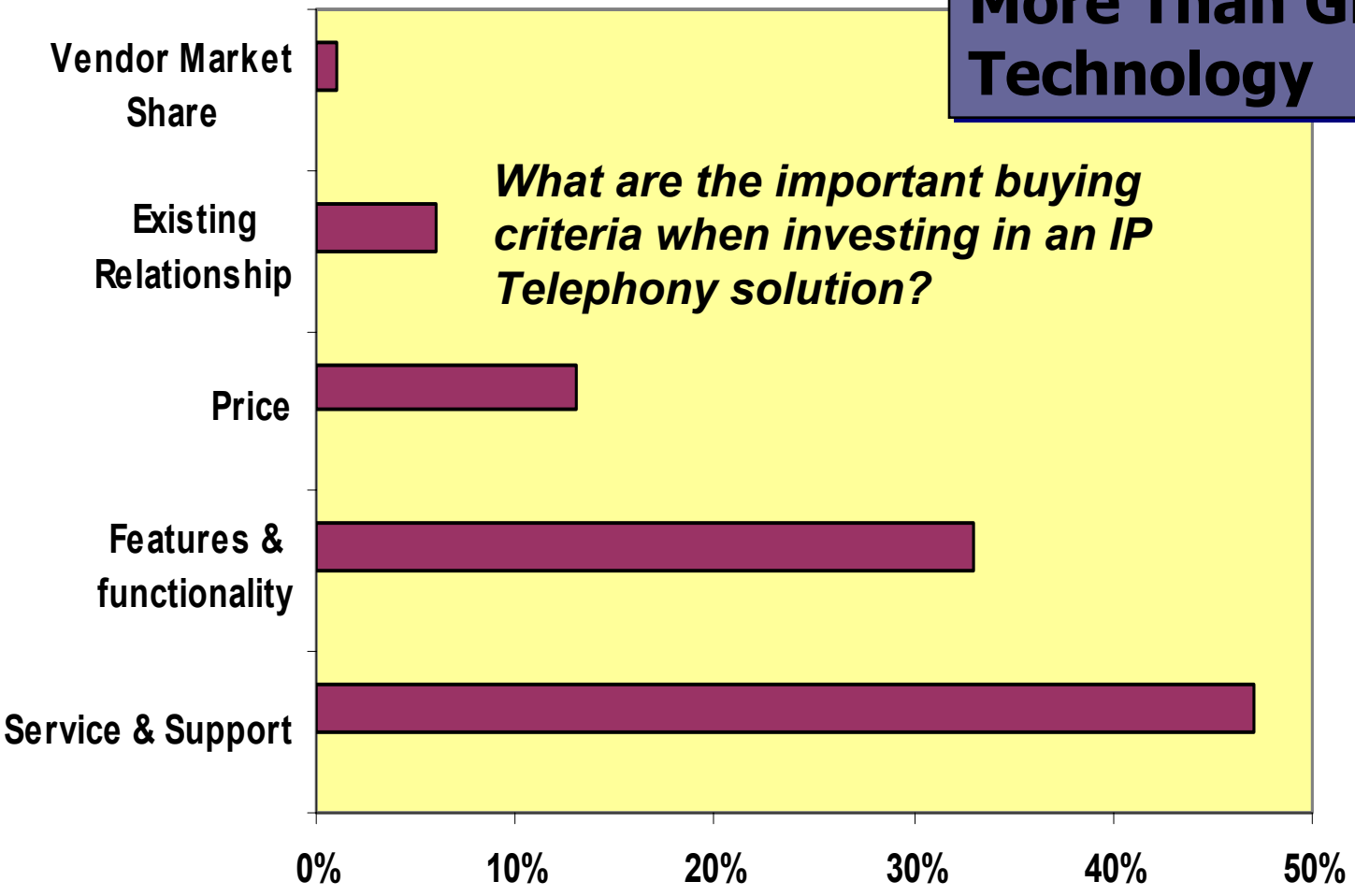
Annual Growth Rates	2001-02	2002-03	2003-04	2004-05	2005-06
IP-Enabled New End-User Revenue (K)	78%	65%	38%	5%	-11%
IP-PBX New End-User Revenue (K)	22%	54%	54%	37%	29%

- Having leveled off in 2002, the overall market is expected to begin growing steadily again in 2003
- **Sales of Traditional PBX to new end-users will shrink rapidly until 2005**
- Important to note that sales of Traditional PBX/KTS Add-Ons will continue after 2006, as current owners seek to maintain and leverage investments in existing infrastructure; but will not exceed an additional 10-20% of the New End-User Market.

Source: Gartner, 2003

Gartner: Important Buying Criteria

Customers Want More Than Great Technology



Source: Gartner Consulting. World-wide End User Study of Voice Decision Makers

VoIP Industry Trends

- Hospitality industry is lagging behind the other industries
- Manufacturers are placing a heavy emphasis on VoIP technology and are focusing on the production and enhancement of these systems
- Most of the “Hospitality” functionality is being ported over into the VoIP solutions
- In some cases will be phasing out the sale of traditional TDM solutions – *Will still be supported*
- Most are placing an emphasis on hybrid TDM solutions as a way of transitioning existing TDM installations
- Pricing of systems targets the luxury market
- The pricing of devices are going to continue to come down as the technology gains more acceptance

Trends in VoIP Installations

- Primarily focused on new construction properties – due to infrastructure requirements
- Targeted at the luxury market
- Most installations tend to be hybrid solutions incorporating analog and VoIP extensions in the guest rooms
- Applications are still very much lagging behind
- Installations require extensive configuration of VLANs etc… to ensure connectivity and security
- Policies and procedures for support and maintenance still being established

Key VoIP Considerations in the Hospitality Industry

- Price – Still a major barrier
  - Prepared to spend for Admin use but not guest rooms
- Stability of the technology and solution
- Redundancy
- Security
- Need to future-proof solution without sacrificing performance
- Potential revenue generation capability

Key Advantageous of VoIP

- Least Cost Routing – especially International calls
- Enhanced “hospitality” functionality
- Convergence of Voice, Data & Video technology
- Promise of “unlimited” number of applications that can reside on “network”
- Future integration of hotel applications with guest’s devices
- Can accommodate small to large infrastructures
- High quality audio
- TV’s are not always on – phones are!

Least Cost Routing (LCR)

- With multiple locations, it becomes possible to route calls over the least expensive connection
- Making a call from Dallas to New York. Have the call go out from the NY Hotel as a “local” call
- Need to ensure the correct Call accounting and tracking is set in place

Discounted International Long Distance Calls

- New VoIP offering can save as much as 70% on International calls
- Work with existing legacy PBX's
- Installation of VoIP gateway and Hotel Call Accounting Billing system (Interfaced to PMS)
- Increase property phone revenues due to focus on getting pricing level to be attractive for guest use
- Guest centric – can focus on particular international demographics
- Offer unlimited 24 hr calling packages to targeted areas of the world
  - Africa, South America, Europe etc….
- Great solution for international guests with cell phones

VoIP Applications

Guest Centric Features of a VoIP System

- PMS integration – Name display etc…
- Tie in guest preferences from PMS
- Visual reminders (Messages, notifications etc…)
- Push content to the guest
- Advertising opportunities
- Marketing aspects

VoIP Applications

- Room Service
- Concierge
- Order items from in-house shops
- Integration with PMS
- HSIA
- Request golf / restaurant reservations
- Book entertainment tickets
- Advertising for in-house stores & restaurants
- Weather reports
- Multiple languages

Guest Convenience at a Touch

- Soft buttons, intuitive and easy to use
- Internet guest services
- Wake-up and reminder services
- E-mail
- Directory services
- Hotel service display
- Staff information and access
- (Third) party advertisement

VoIP Applications Main Modules

- Hotel Services
- Information Services
- Telephone Billing System
- Wake-up Call
- Voice Mail
- Hotel e-Mail System
- Maid Services
- PMS Interface

Cisco Compatible

Information Services

- Mostly linked by xml
  - Hotel facilities info
  - National directories
  - Meeting room reservation
  - Online billing
  - Weather info
  - Airline info
  - Enhanced reminders
  - Currency rates
  - Stock Quotes
  - Local and Third party advertisements
- Require “live” data-feeds

Wake-up Service

- IP Based wake-up and reminder service
- Wake-up time registration
  - on the telephone
  - via reception (PMS)
- Confirmation and snooze functions
- Event logs
- Failed wake-up management

Guest Voice-Mail

- Check-in , Check-out account creation and deletion
- Room mobility and transportability.
- Policy based archiving after check-out
- Message Waiting Indicator control by reception for paper messages
- Multiple language support
- Shared guest support

Hotel e-mail Service

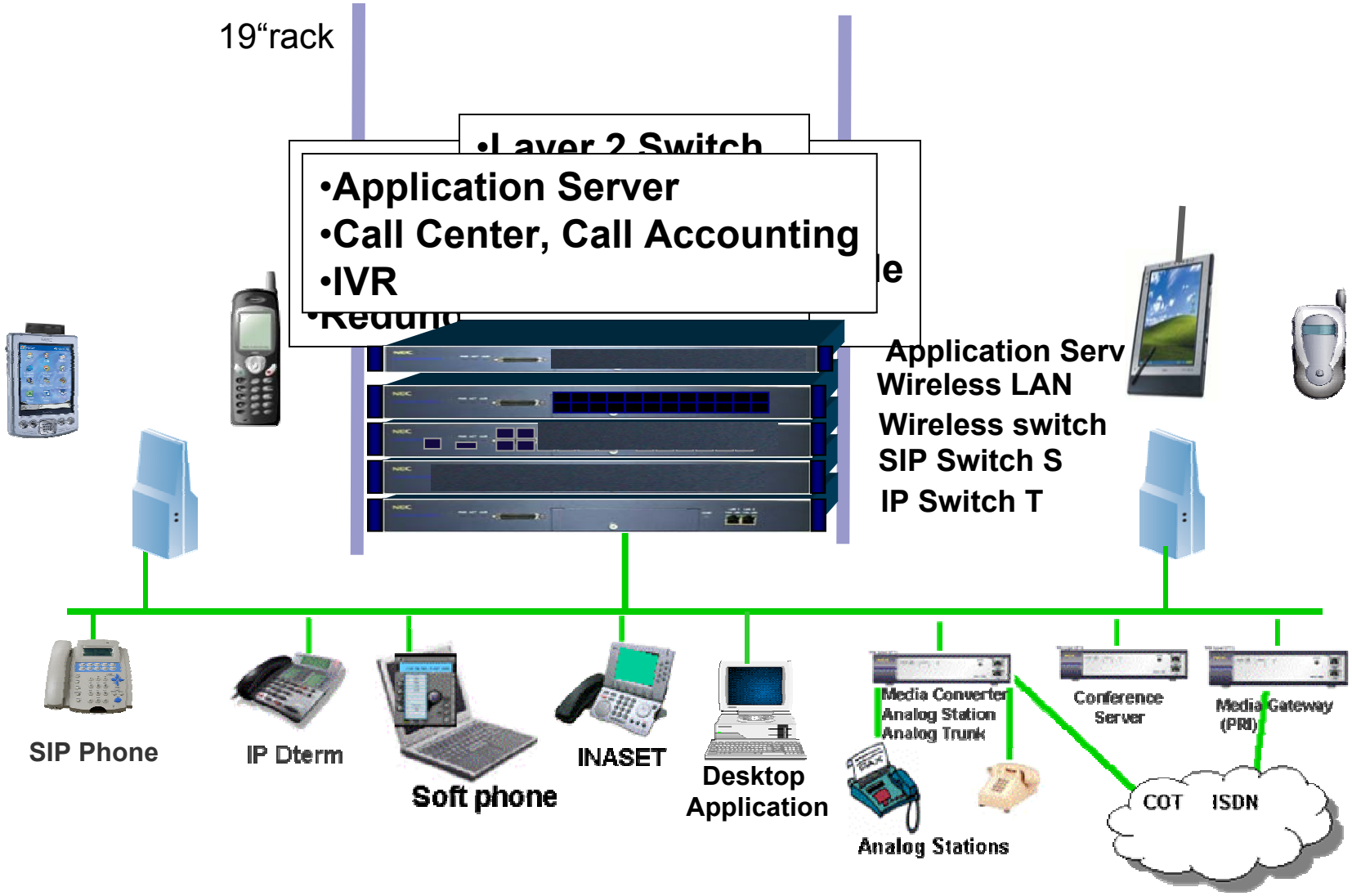
- Enables guests to send email without using a PC
- Interactive Voice Response guided multi-media
- Sends voice message as email attachment
- Success/Failure reporting by voice mail
- Can charge guest for service
  - Almost 100% profit margin

Targeted Revenue Streams

- Integrated loyalty programs
  - Use of unused pts to pay for certain services
- Outside advertising
  - Restaurants
  - Transportation services
- Email Services
  - Sending recorded audio files via email

VoIP Implementations

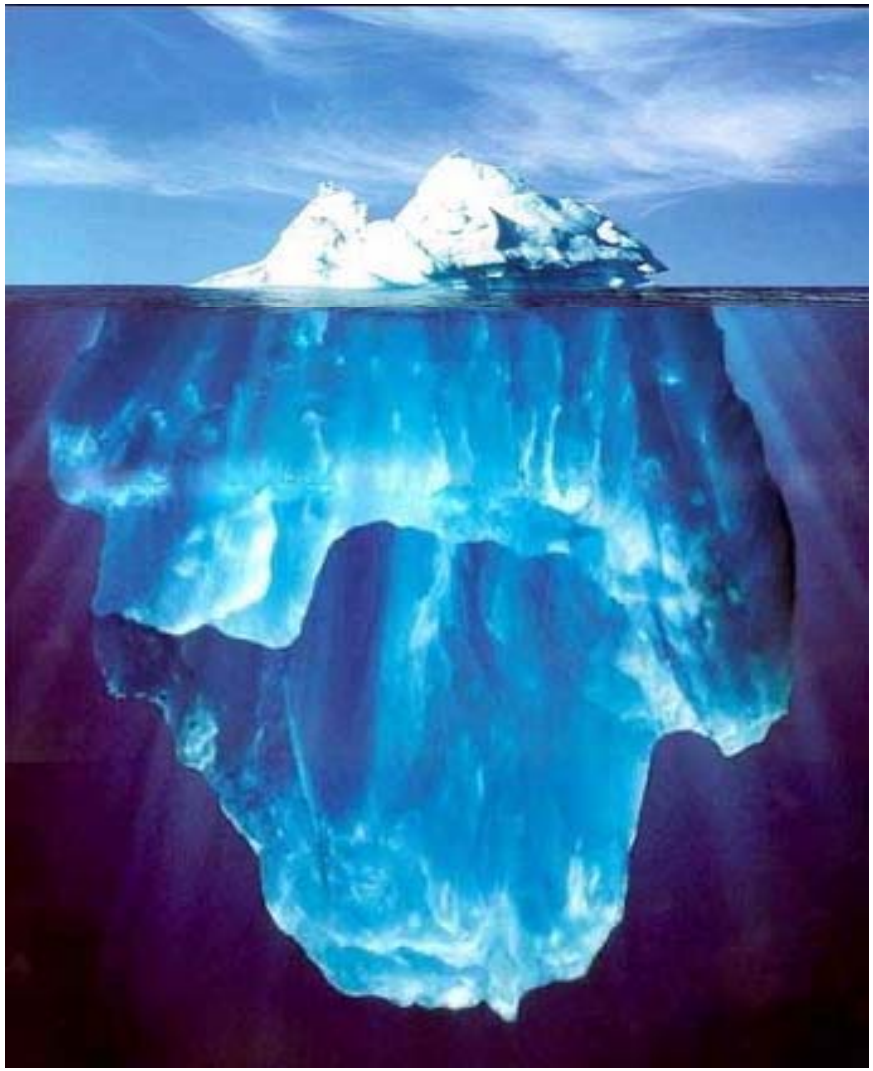
The Building blocks for an VoIP Switch



Is your hotel ready for VoIP?

- Typical infrastructure requirements
  - Cat5 or Cat 6 cabling to the rooms
  - Fiber backbone
- Use of preliminary site surveys
  - Analysis of network
  - Analysis of infrastructure
- Cost / Benefit Analysis

VoIP Network Assessment



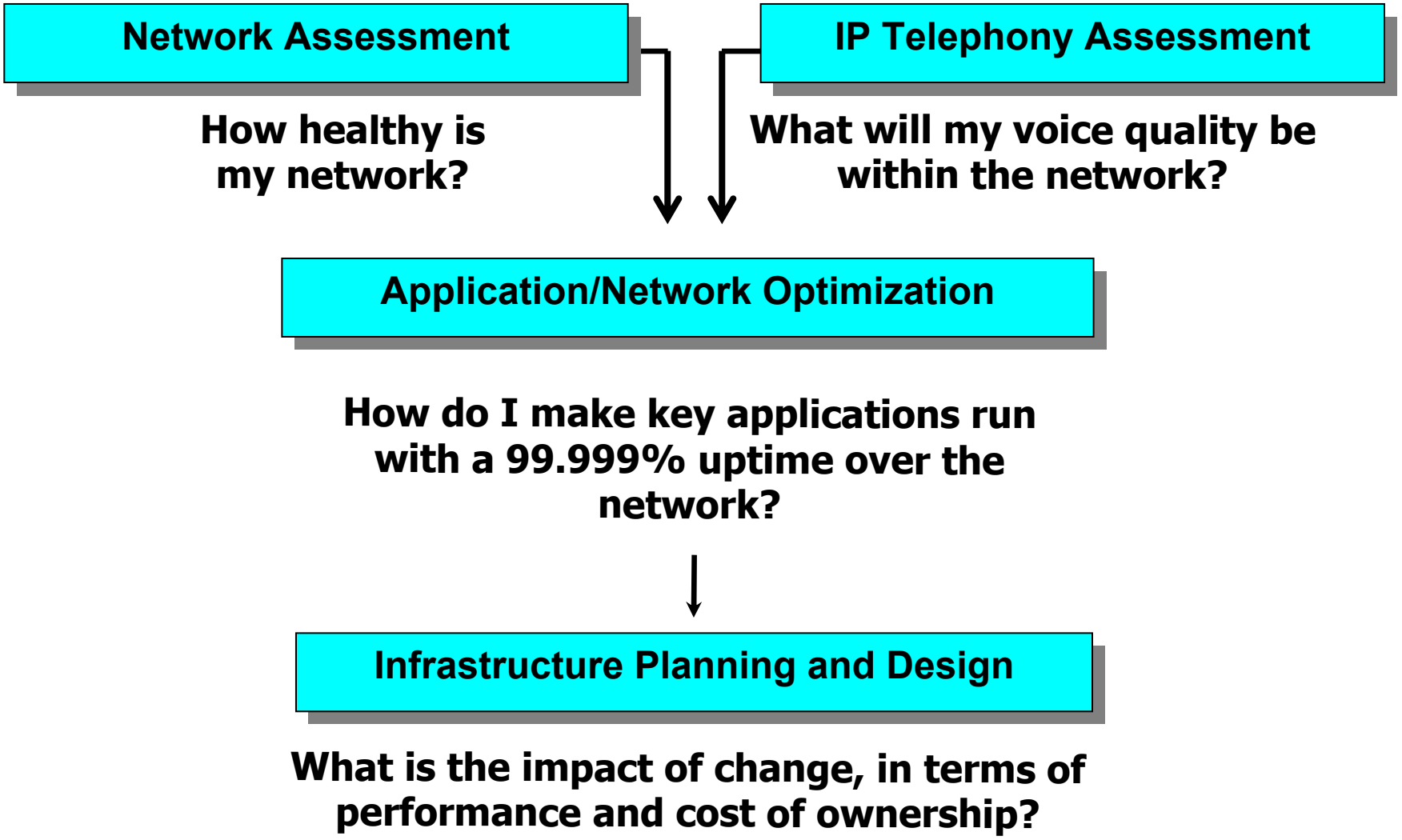
Systems Residing on the Network

- IP Telephony
- Video Technology
- Network Applications

Potential Issues to be concerned with

- Network Design
- Network Performance
- Network Security
- Network Management & Monitoring

Network Performance Process



Typical VoIP Concerns.

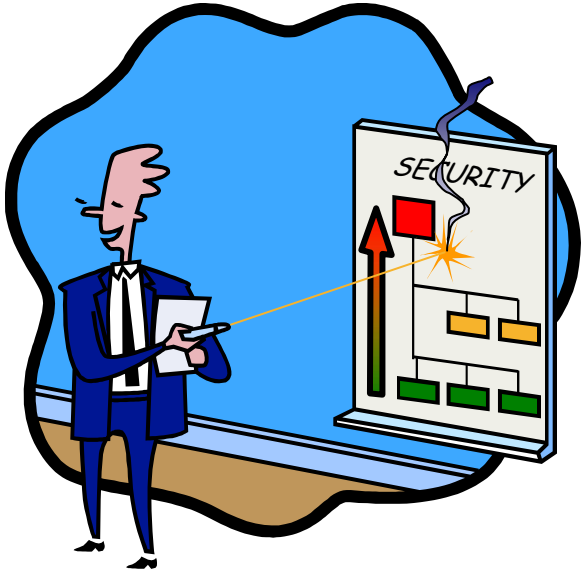
- Quality of Service (Qos)
- Security
- Redundancy
- Guest's adaptation to the new technology *(Are we scaring or overwhelming some guests?)*
- 911 Emergency Services
- How to manage the new technology?

Determining Bandwidth Requirements

- VoIP Quality of Service (QoS) issues usually are associated with bandwidth Concerns
  - Need to have sufficient bandwidth
  - Needs to be stable
- Network assessments can help to determine bandwidth requirements
- Traffic studies can be done once the VoIP is installed:
  - Monitoring via software in the switch
  - Requesting traffic studies from the circuit carrier
- BTW – Traffic studies should be done regularly with TDM solutions as well

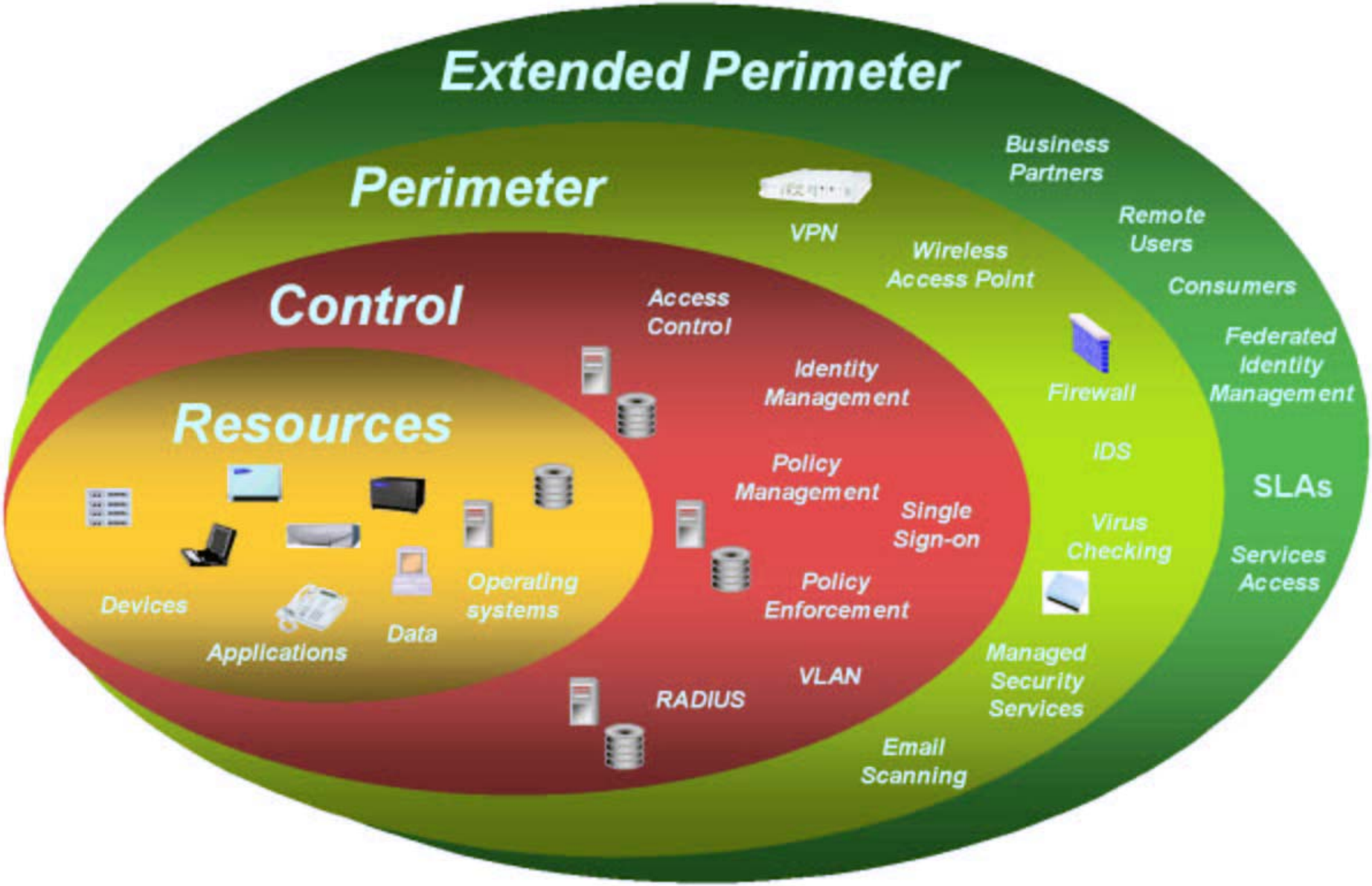
I DON'T KNOW... WOULD YOU LIKE TO SPEAK TO THE PERSON WHO MAKES UP MY MIND FOR ME?

Security Concerns



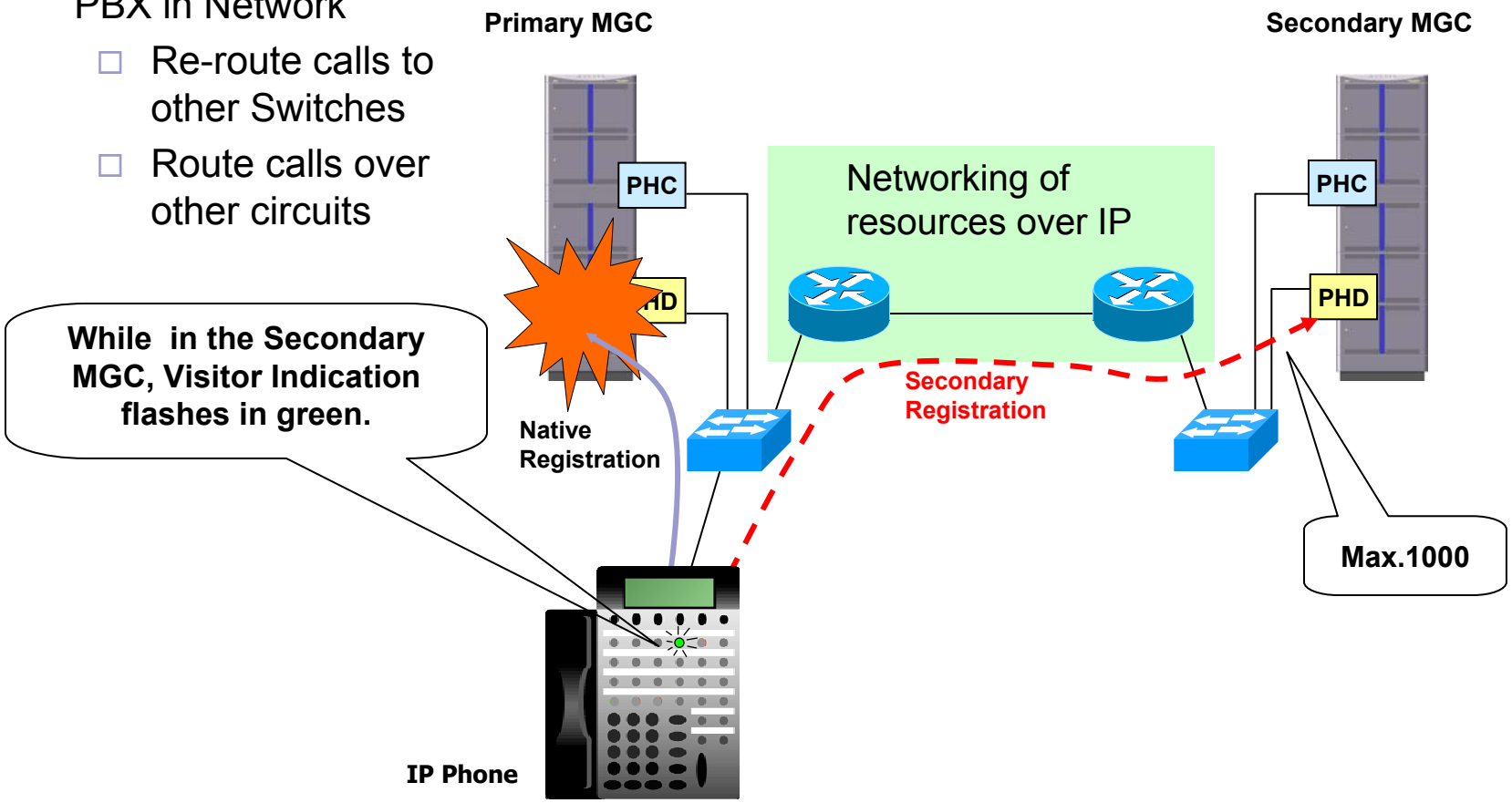
- Network security – *fear of intrusion or release of virus*
- Need separate VLAN's
- Encryption of voice & data within VoIP solution
  - *(Some manufacturers are better than others in this regard)*
- Avoid "spoofing" of MAC addresses
- Moving of phones between rooms could not only cause a problem with the wrong extensions ringing, but could also be a problem for 911
  - Solution is to remove the IP address the minute a phone is disconnected

Security Analysis



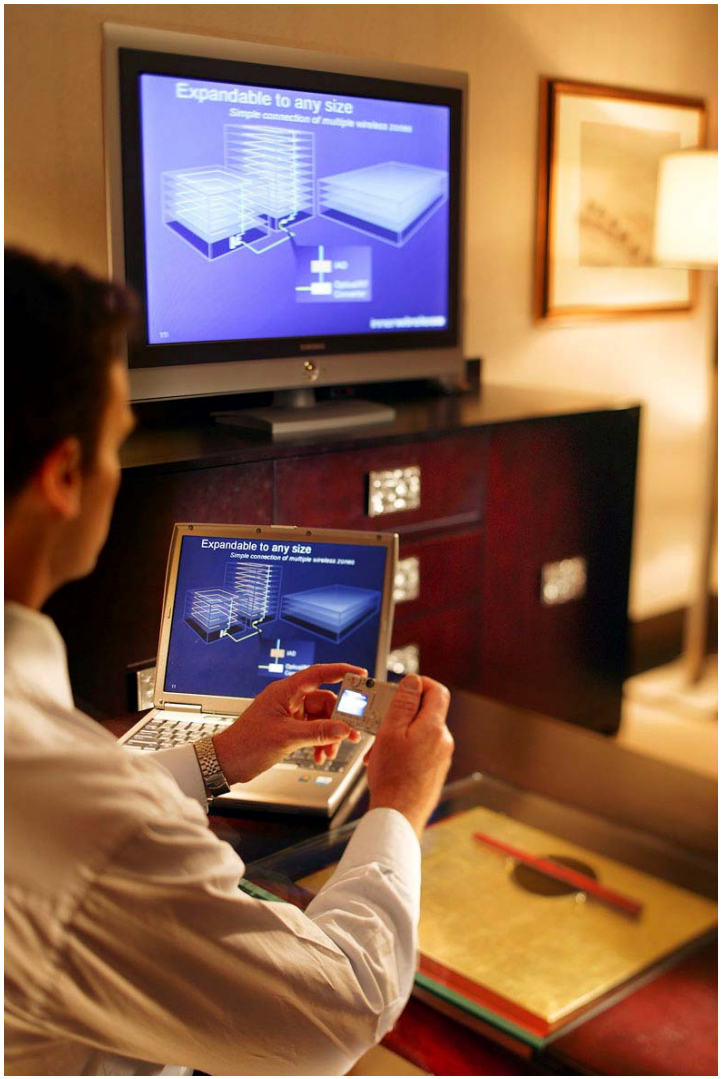
VoIP Redundancy - Terminal Failover to Backup PBX

- IP Failover to Backup PBX in Network
  - Re-route calls to other Switches
  - Route calls over other circuits



Guest's adaptation to new Technology

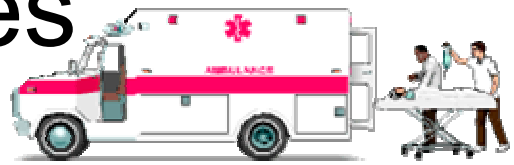
- Problem with having to educate guests to the use of the latest technology
- Technology will lag behind what is taking place in the business & residential worlds
- Large in-roads to VoIP in business
- Easy to use screen & menu formats
- Need to cater to the "non-technical" guests – don't want to scare people who simply "just want to make a call"



Maintenance Concerns

- Up until now most Hotels have had their engineering departments addressing PBX maintenance
- Now IT has to manage “Network”
- Many vendor technicians aren’t trained Network engineers
- Who is going to setup the system, configure the VLAN’s, address security issues?
- Policies & Procedures need to be worked out and put in place
- More complex….

911 Emergency Issues

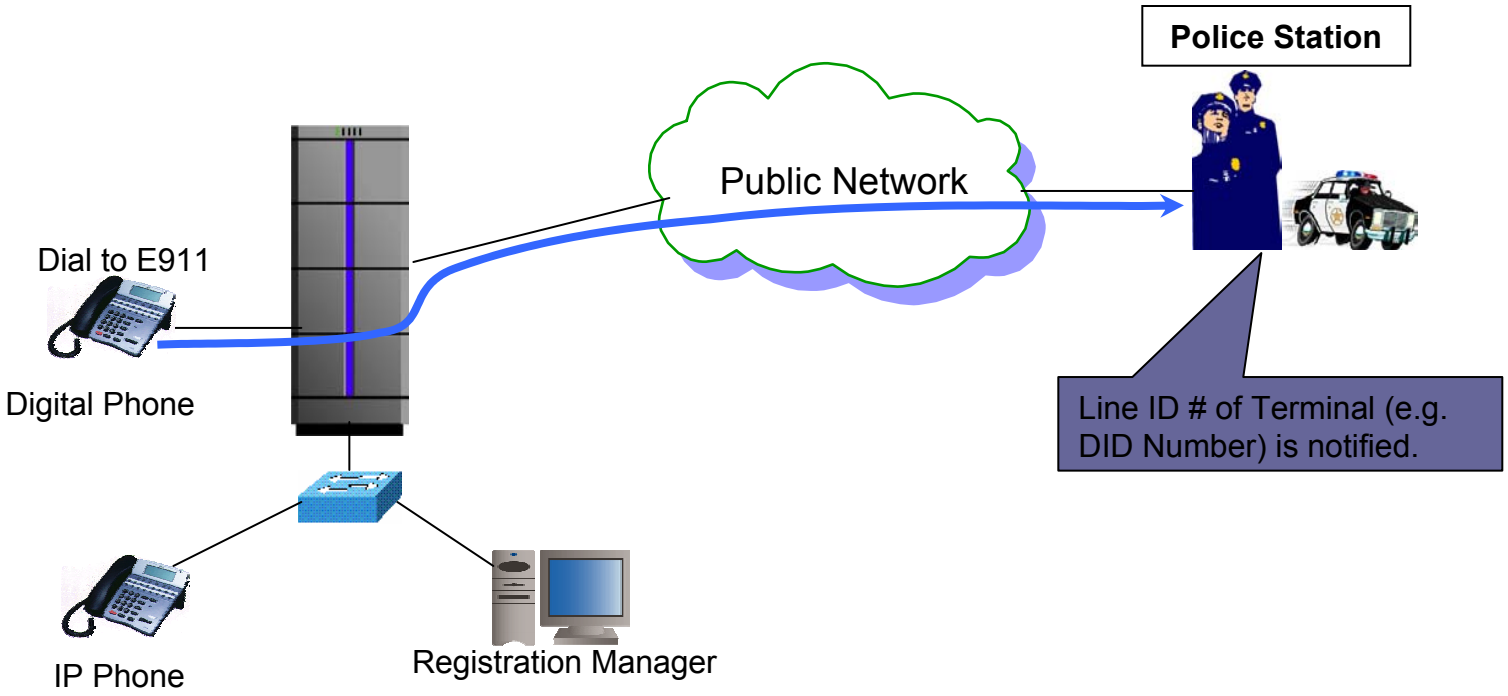


- Due to the portability of an IP based phone, difficult to know exactly where the phone is.
- With multiple locations and LCR where did the call originate from?
- How do you know which local emergency service center to notify?
- Portable IP-based wireless devices are even more difficult to locate
- Similar to cell phone problem

- To partially resolve problem, ALL Emergency calls should be routed over local lines
- Phones and extensions cannot be relocated from the identified location in the Hotel

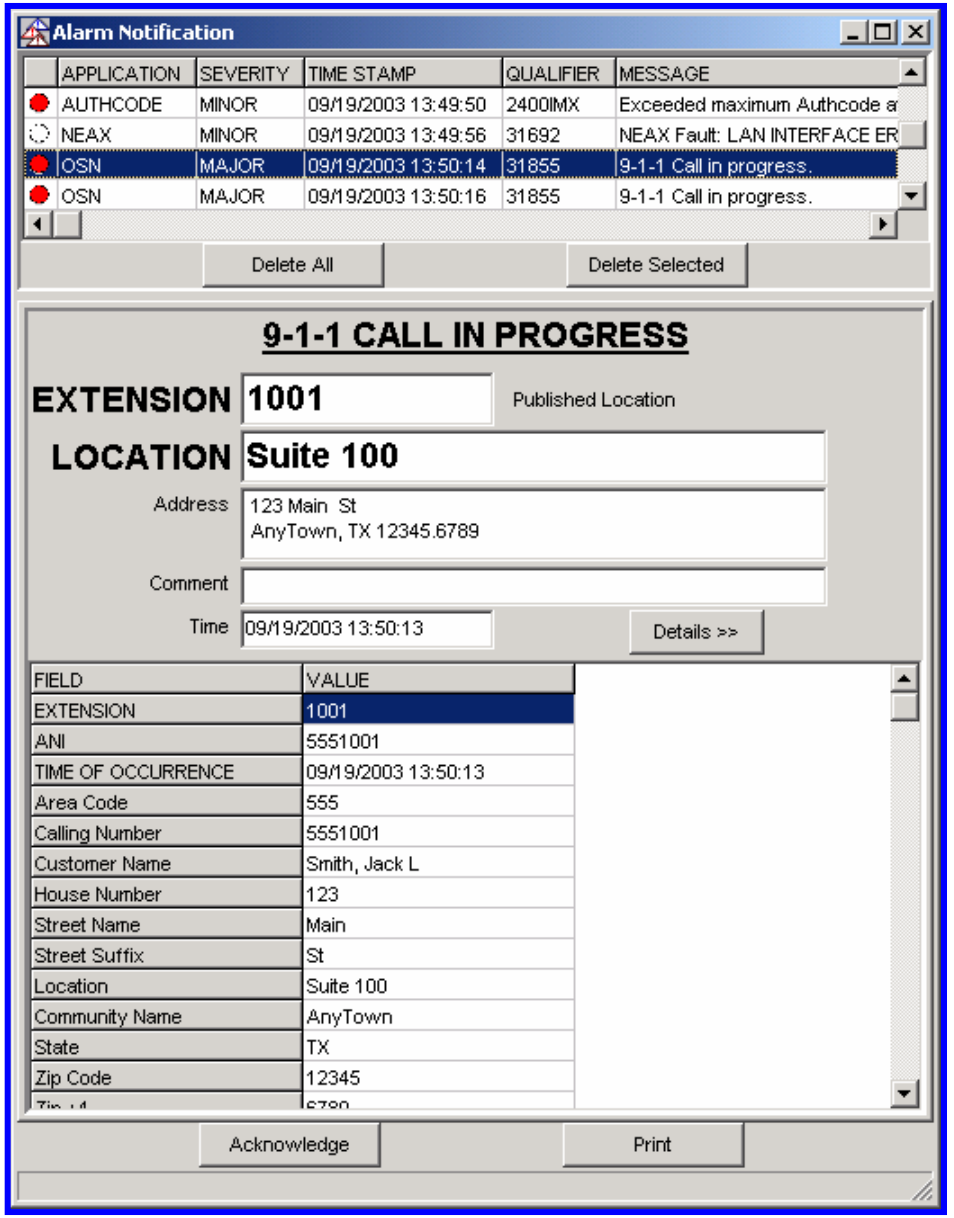
E911 – Location Identification Number

- 911 Calls from VoIP switch routes via the Public network (Send the number from database table based on Line ID #)



911 Alarms

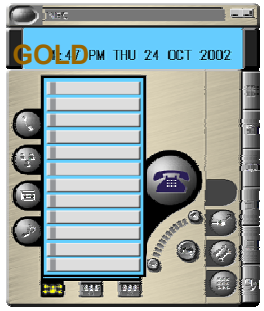
- Alarms can be visual in nature
- Notify a number of selected departments & individuals
- Notification by phone, email, pager etc…



SoftPhones

IP Multimedia SoftPhone

- Applications Collaboration
  - NetMeeting
  - 2 Way Video Conferencing
  - Application Sharing
  - White Board
- Short Text Message
- Telephone Directory Integration
  - Drag and Drop
  - 32 Number on Function Key panel
  - 12 Numbers on the Main Panel



Wireless IP Phones & Devices

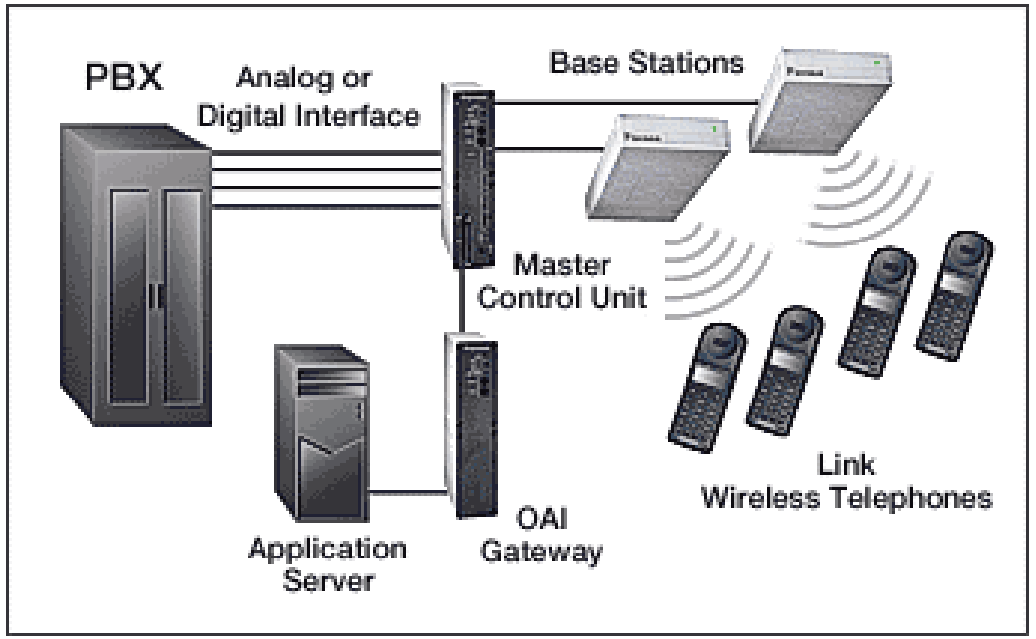
- Mainly being used by administrative offices
- Visual display can provide caller information
- Provide an extension of office while being mobile in the hotel
- In some cases being provided to some VIP guests
- Starting to replace the traditional radio communication systems

Wireless Concerns

- Qos issues where the signal is not strong enough
- Security “in the air”
- Deployment of a wireless 802.11 infrastructure
- Difficult to implement over large areas

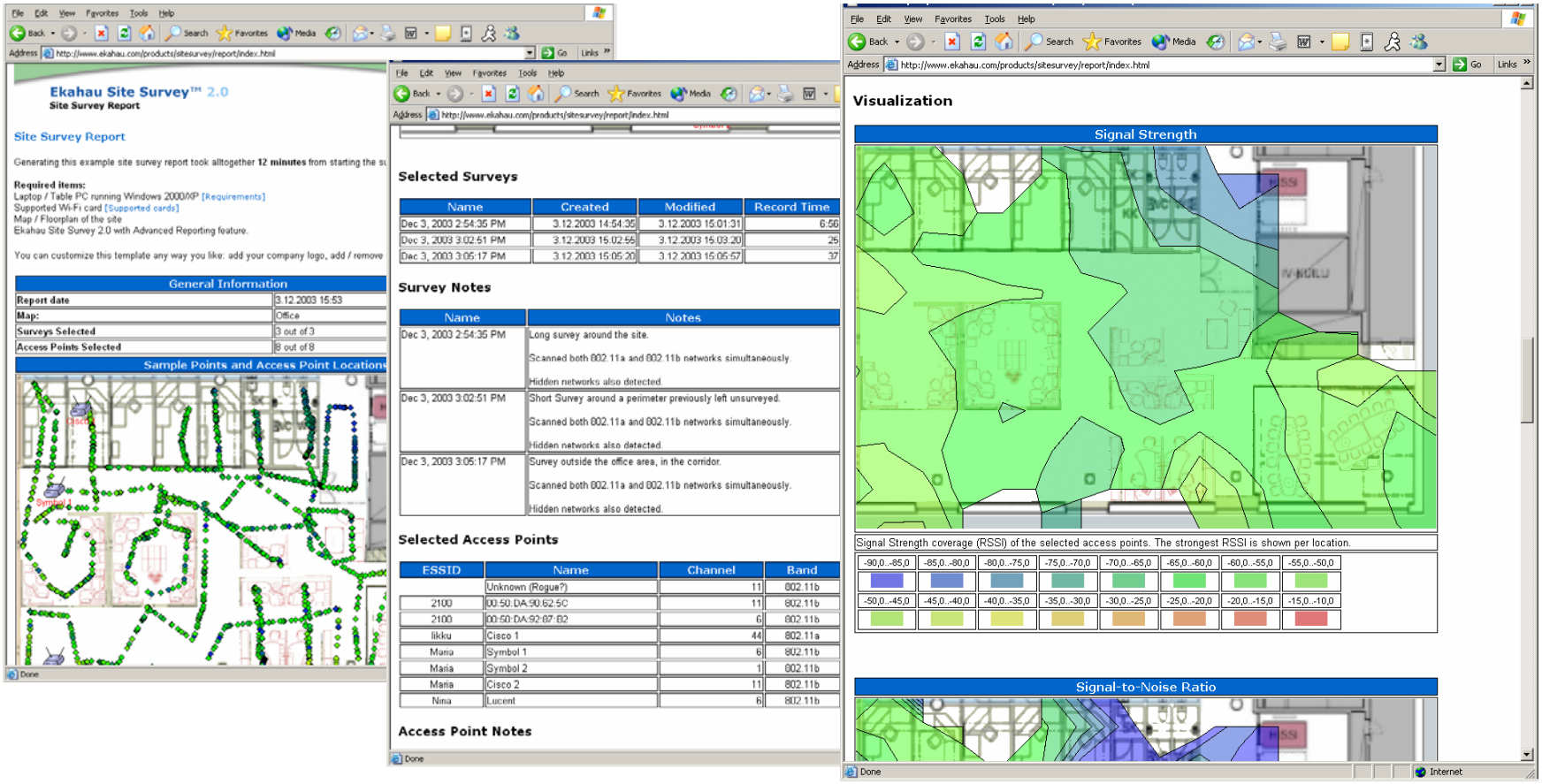
Wireless phone solutions

- There are 3rd party solutions that work with either VoIP or the traditional TDM solutions



Wireless Site Survey Tools

A proper wireless survey can help design a good wireless network and alleviate QoS issues associated with poor coverage



Cell Phones – integration to Hotel VoIP network

- IP enabled cell phones have the potential to be attached to the network
- Phones can become an extension of guest room phone
- Phone can receive and make calls through the IP network rather than via cell service
- May be clearer in some cases than cell service
- Guest's have one phone to work with rather than multiple sets

SIP – "Session Initiated Protocol"

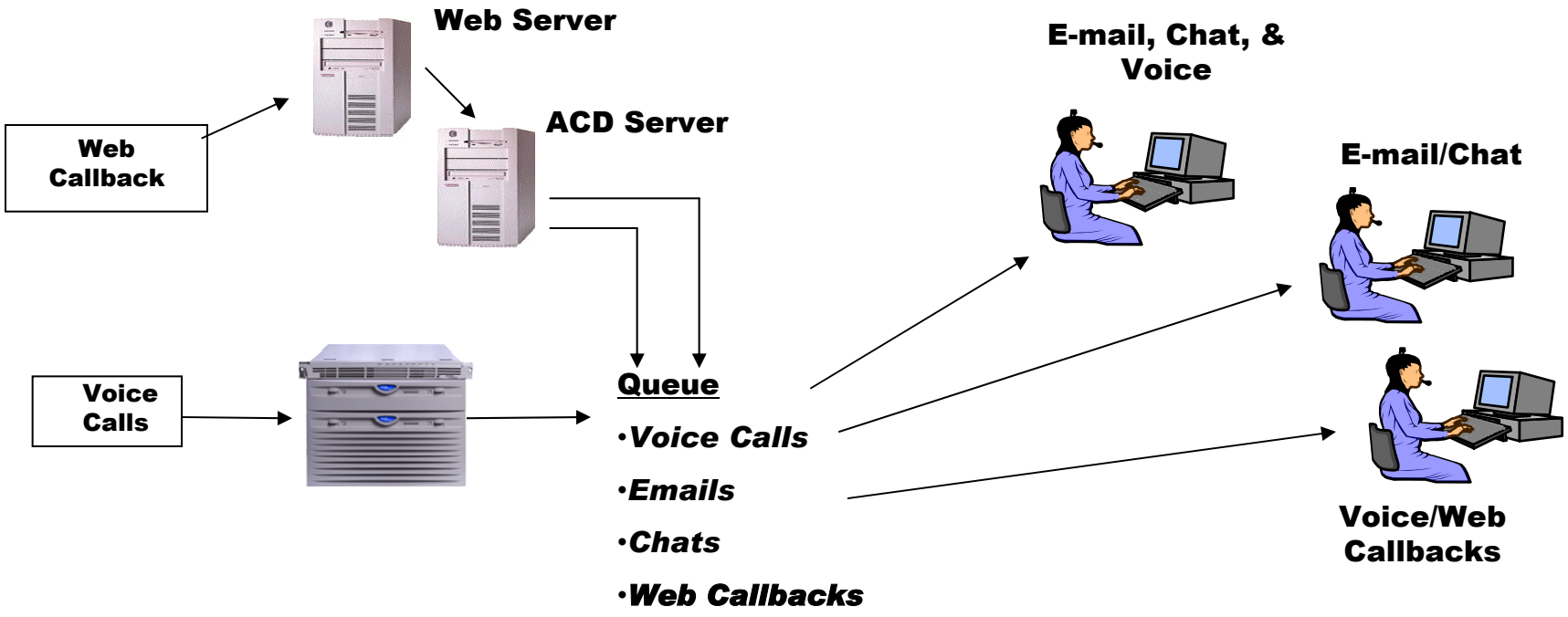
- SIP is currently a limited standard – leverages internet based std's
- SIP provides a more cost effective solution to IP phones
- Enables presence and instant messaging
- Look for SIP phones to replace the traditional analog guest room phones
- Prices for SIP phones are expected to eventually get to around $20
- Can cut IP Phone costs down
- Can be used with DSL or cable solutions

Multi-media Reservation Centers

Multi-media Reservation Center Overview

- Web Callbacks

  Additional option for website assistance for customers on the Internet who decide they would prefer to talk to a live agent.



Multi-Media Reservation Center

- A M-M reservation center offers the following benefits:
  - Significantly increase the number of transactic handled without adding costly phone trunks.
  - Increase service levels by offering additional and lower-cost contact channels to customers
  - Minimize the idle time caused by fluctuating traffic by allowing blended agents to handle “non-live” transactions such as e-mail when there are no “live” transactions queued.
  - Utilize all reservation center resources more consistently throughout the day regardless of the present number of incoming transactions.
  - Agents can service customers from remote locations, such as a remote sales office or even a home office.

ACD – New IP Feature Set

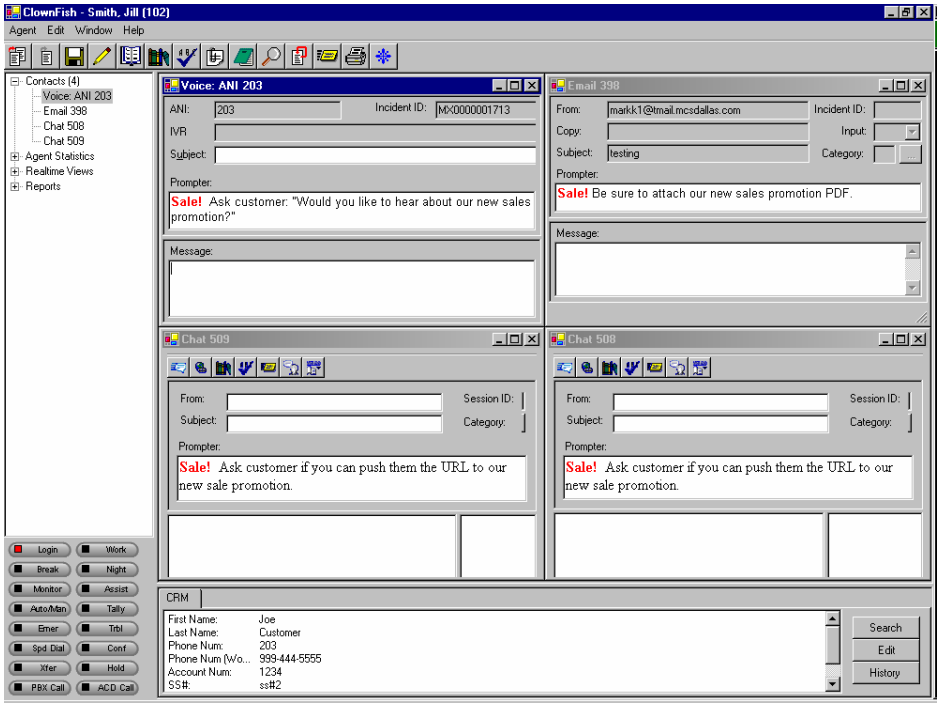
- Auto Attendant
- Immediate Callback
- Scheduled Callback
- **Web Callback**
- Voicemail Transfer
- ETA Announcement
- Q-Depth
- Incoming calls can be routed based on:
  - Account Code (SSN, Student ID, etc.)
  - Automatic Number Identification (ANI)
  - Area Code (up to first 8 digits of ANI)
- Announcement
- ANI Routing
- Account Code Routing
- Screen-pop
- **Soft phone**
- Visual Queue
- Abandoned calls ANI Report for callbacks
- **Caller's identifying information is displayed on agent's soft phone.**

Remote Agent Possibilities

- Agents do not have to be located in the same location
- Can operate from home office seamlessly
- Ability to find better quality of staff:
  - Flexible hours
  - Part time / full time workers
- Lower operating costs – assists with facilities that have limited space
- Can host small or larger centers
- This is especially beneficial for small reservation centers that need to operate with flexible hours
- Allows hotels to keep trained staff who cannot commute to Res office

Unified Reservation Agent Desktop

- Multi-channel contact management – voice, e-mail & chat
- Customer contact information
- Login & logout
- Status control
- Task list
- Real-time statistics
- Soft phone
- Wallboard
- Dialog prompter
- Screen-pops
- Business application panel



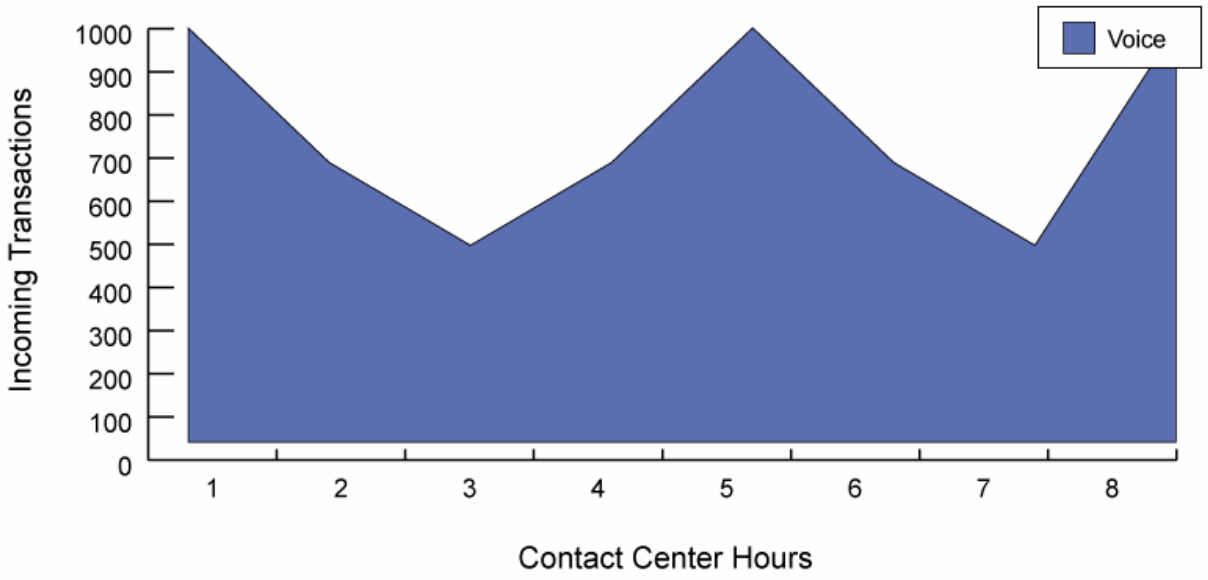
Customer Expectations

- **What Do Today's Customers Expect?**
  - Callback options from your Web site.
    - Immediate
    - Scheduled
  - *Toll-free numbers tend to place callers in a queue where they have to wait for an agent to assist them.*

Multi-Media Reservation Center

- **Voice Contact Center Activity**
  The number of transactions coming into a reservation center will fluctuate regularly throughout the day.

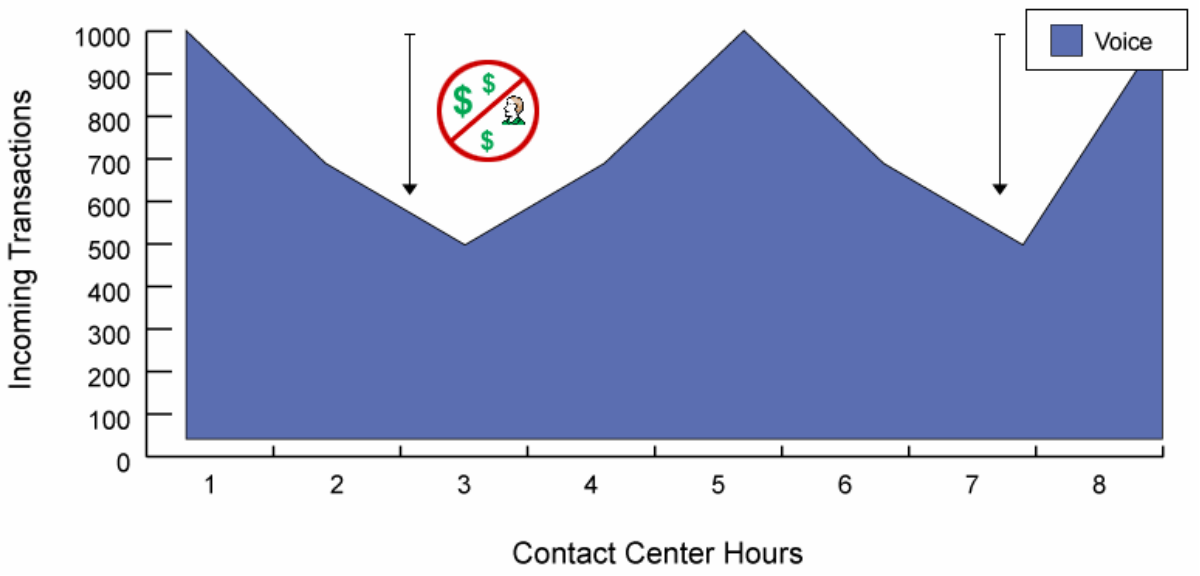
  It follows that the number of agents required to handle these transactions will fluctuate accordingly.



Multi-Media Reservation Center

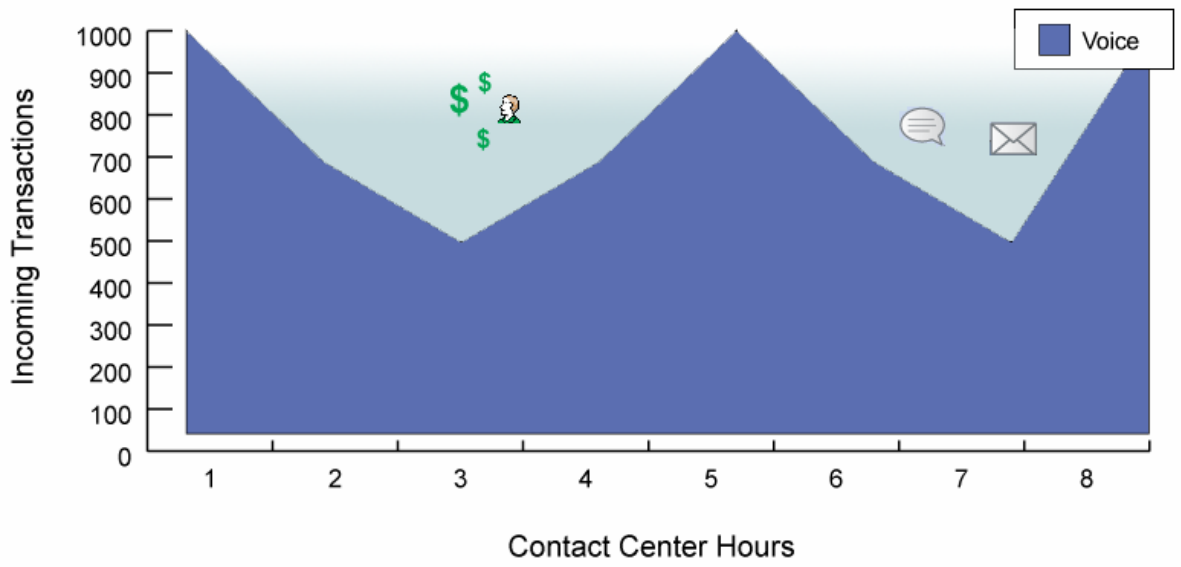
- **Are Resources Being Used Efficiently?**

  Are your valuable resources being wasted during these off-peak times? How can you turn idle agent time into greater **productivity** and **profit** while actually increasing the level of service offered?



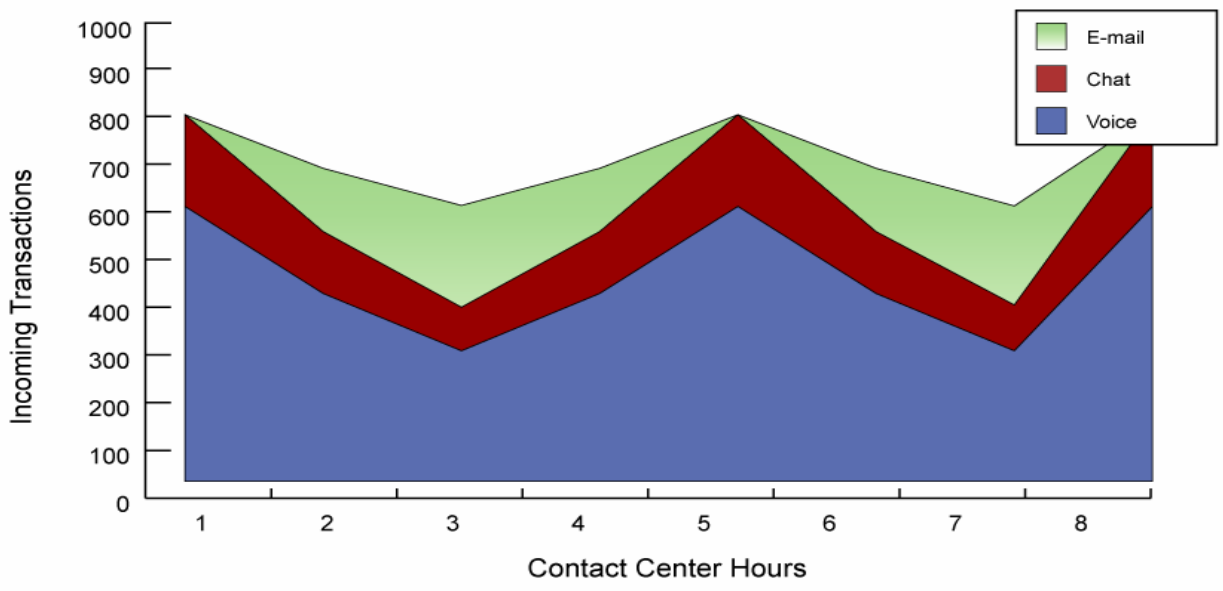
Multi-Media Reservation Center

- **Maximize Productivity**
  You can maximize productivity and minimize agent downtime by blending lower-cost media channels into your reservation center, such as e-mail and chat!



Multi-Media Reservation Center

- **Unified Reservation Center Activity**
  By adding **chat** and **e-mail** transactions to this reservation center, research indicates that the number of voice contacts can be reduced by as much as 40%!



Cell Phones

Cell Phone Update

- New Calling plans offering large per minute usage
- Integrated voice and data (Internet Access Plans)
- SMS text messaging is now being used widely in the business world
- Phone video's are becoming very popular
- Look to see these devices expand to become a key component in the Personal Digital Domain of consumers
- The addition of 802.11x connectivity will allow cell phones to be attached to networks and ultimately VoIP systems

Cell Phones – Hospitality Integration

- Look to see these phones becoming integrated with guest room technology – especially VoIP phone systems
- In Japan, they are testing new “charge” phones that will allow users to pay for goods & service via blue-tooth technology
- GPS integration will allow hotels to know where their guest’s are and provide for better security and service
- New VOD features allow cell phones to receive and view Video – allow guests to access hotel information etc…
- 911 callers will be better identified and local emergency staff on site can be better prepared to respond to such calls.

Cell Phones – Security Concerns

- New cell phone virus discovered last week
- Look for larger security features to begin being implemented into the devices
- Could be a potential problem if these devices are eventually connected to the Hotel's network
- Malicious virus's could have very harmful effects:
  - Personal Identity theft
  - Expose contact list and information
  - Expose confidential business information

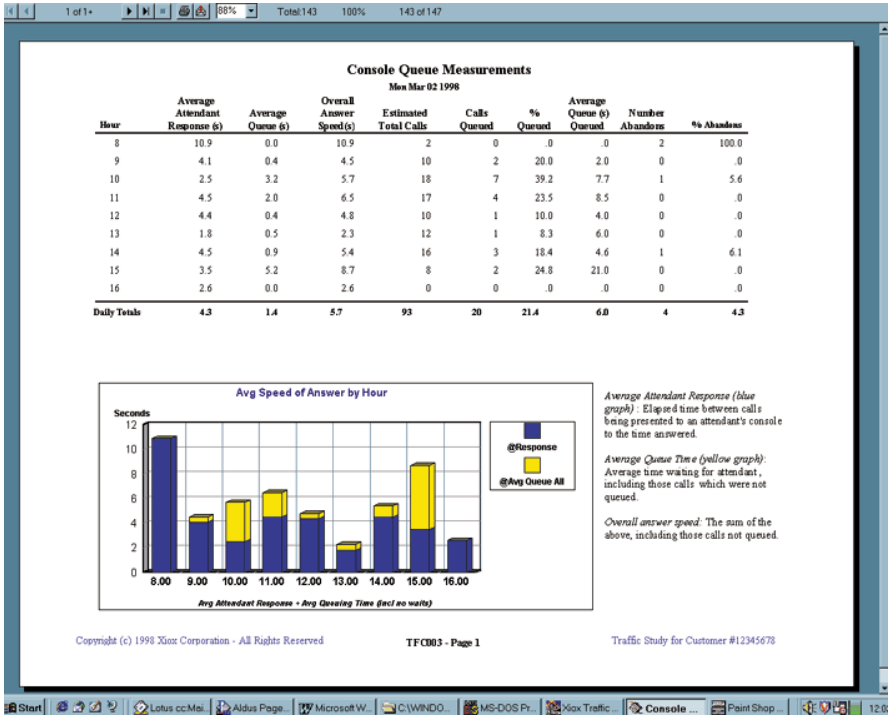
Telemarketers could soon be calling your cell phone

- Cellular Telecommunications Internet Association wants to create a directory listing all the cellular phone numbers in the entire country
- You would be able to access the numbers by calling 411
- Cell phone directory would be a "gold mine for telemarketers, spammers and pranksters" who would use it to send unsolicited marketing calls to consumers

Call Accounting

Call Accounting - Overview

- Focus on guest centric solutions and flexible billing plans
- Enterprise solutions becoming more sophisticated
- VoIP solutions starting to become a key development
- Guest convergent solutions becoming prevalent
- Carrier call accounting is a great feature for resolving VoIP LCR issues
- Providers starting to focus on the real-time management of the applications rather than simply providing the application.



Console Queue Measurements

Mon Mar 02 1998

Hour	Average Attendant Response (s)	Average Queue (s)	Overall Answer Speed (s)	Estimated Total Calls	Calls Queued	% Queued	Average Queue (s) Queued	Number Abandons	% Abandons
8	10.9	0.0	10.9	2	0	.0	.0	2	100.0
9	4.1	0.4	4.5	10	2	20.0	2.0	0	.0
10	2.5	3.2	5.7	18	7	39.2	7.7	1	5.6
11	4.5	2.0	6.5	17	4	23.5	8.5	0	.0
12	4.4	0.4	4.8	10	1	10.0	4.0	0	.0
13	1.8	0.5	2.3	12	1	8.3	6.0	0	.0
14	4.5	0.9	5.4	16	3	18.4	4.6	1	6.1
15	3.5	5.2	8.7	8	2	24.8	21.0	0	.0
16	2.6	0.0	2.6	0	0	.0	.0	0	.0
Daily Totals	4.3	1.4	5.7	93	20	21.4	6.0	4	4.3

Average Attendant Response (blue graph): Elapsed time between calls being presented to an attendant's console to the time answered.

Average Queue Time (yellow graph): Average time waiting for attendant, including those calls which were not queued.

Overall answer speed: The sum of the above, including those calls not queued.

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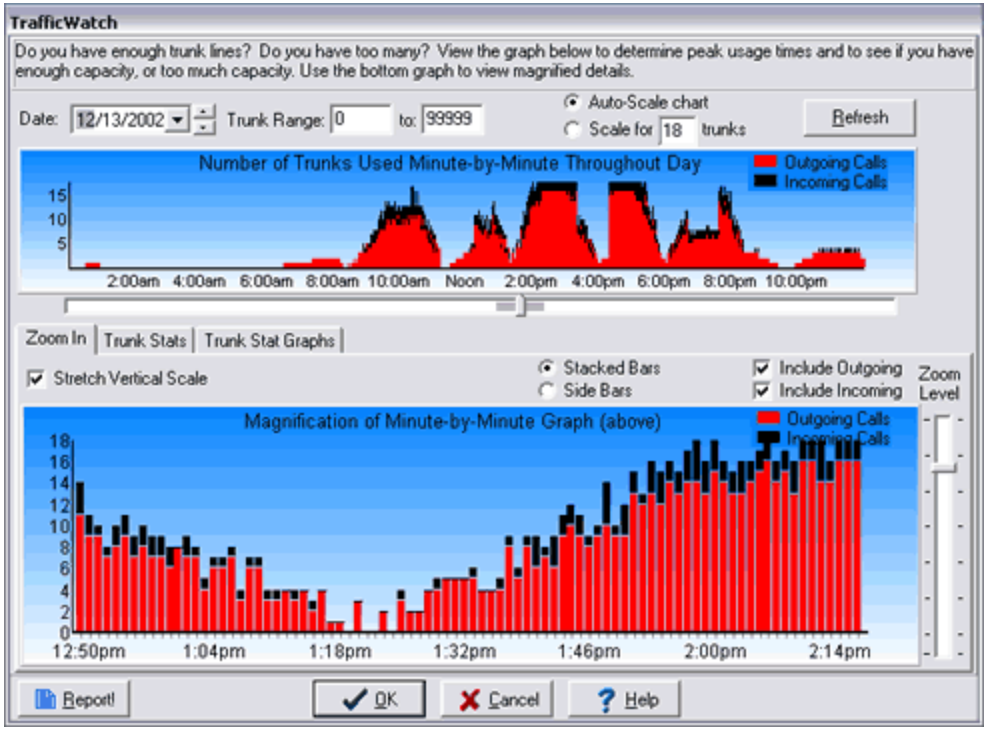
Traffic Study for Customer #12345678

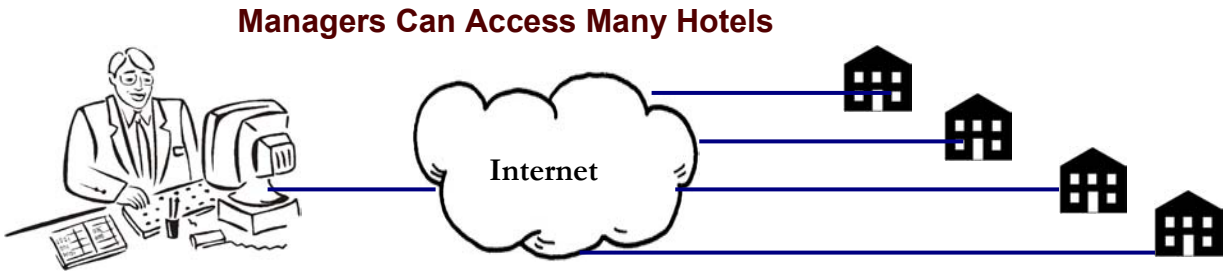
Call Accounting Trends

- The move from individual call pricing model to that of bundling of time and services continues
- CA systems have become more sophisticated and are now more “guest centric”
- Focused on being able to price the call according to who the guest is and what their preferences are – requires integration with PMS
- Need to make it more attractive for the guest to use the phone!

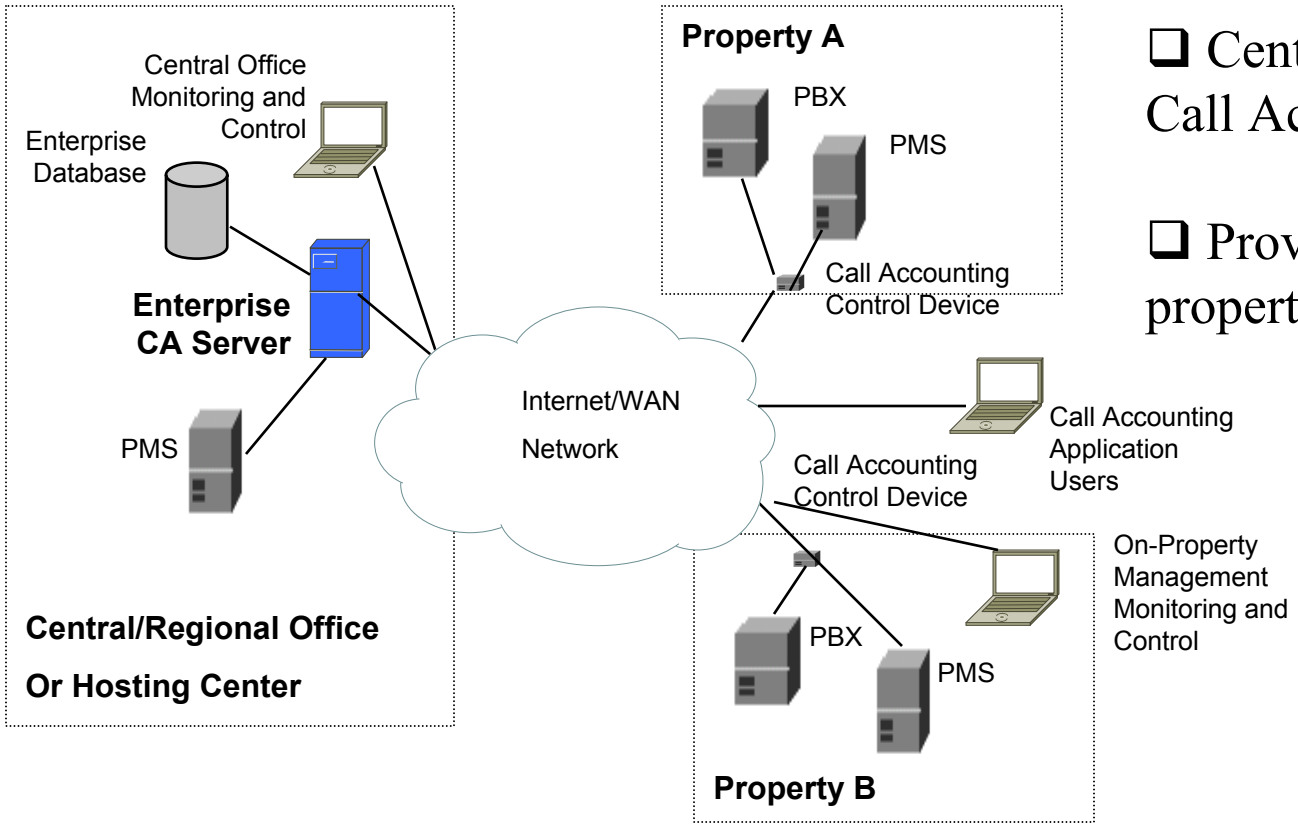


Call Accounting – Enterprise solutions

- Managing multi-unit properties from a central point has become easier.
- Advantages:
  - Standardization across the enterprise
  - Can address one or many properties
  - With one or many service pricing and business models
  - Managed by one or many users
  - Operating in real time over intranets, WAN's, and the Internet
    - Browser format with individual database
    - Using one single integrated data base infrastructure



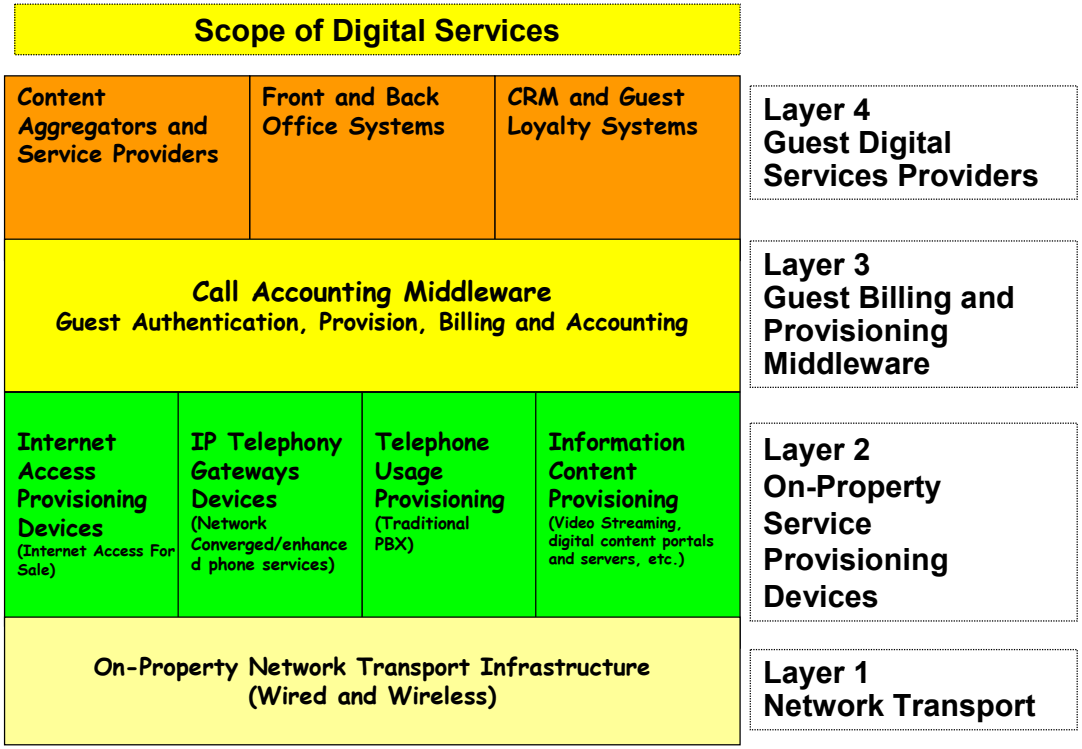
Enterprise Call Accounting For Switched Telephone – Centralized Server Approach



- Centralize or regionalized Call Accounting
- Provides consistent property services.

Call Accounting - Using A “Middleware” Approach

- Consolidate guest digital services billing and provisioning onto a single centralized “middleware” layer.
- Middleware provides a single integration point to/from front and back office systems
- Middleware provides a single platform from which to dynamically bundle, price, and bill guests for services.
- Middleware allows rapid integration of new and multiple services and service providers into the service bundle through a single standard business layer.



VoIP Summary

- VoIP – getting beyond the early adopter stage but still have a ways to go
- Applications are starting to be developed and the real benefits of the technology will begin to be realized
- Security and 911 emergency services issues still need to be addressed
- System deployment and maintenance is in the process of being streamlined