



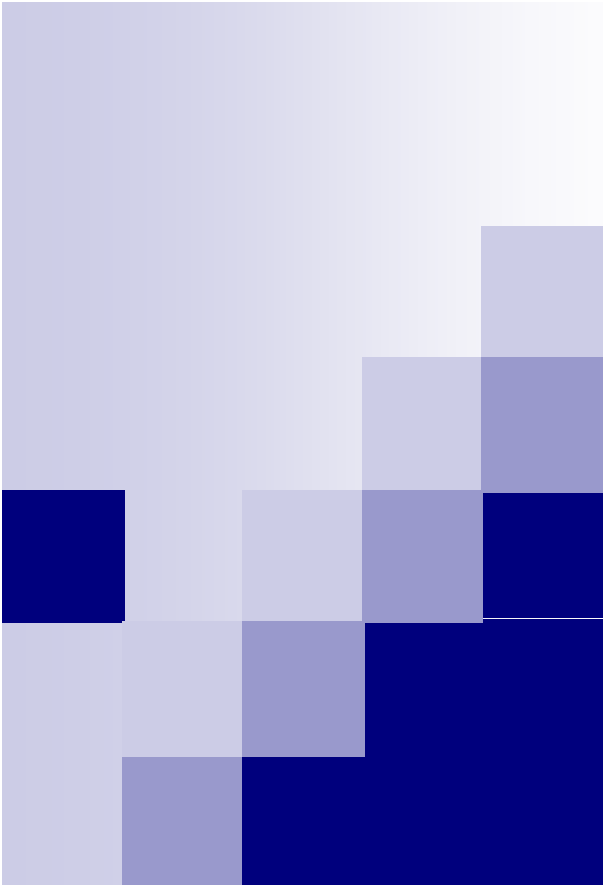
# Making the Move to IP Telephony

Revolution, Evolution or Both?



# Agenda

- Welcome
- Is it the Right Time for IP Telephony?
- Migrating from TDM
- Forms of IP Telephony
- Is Your Network Ready?

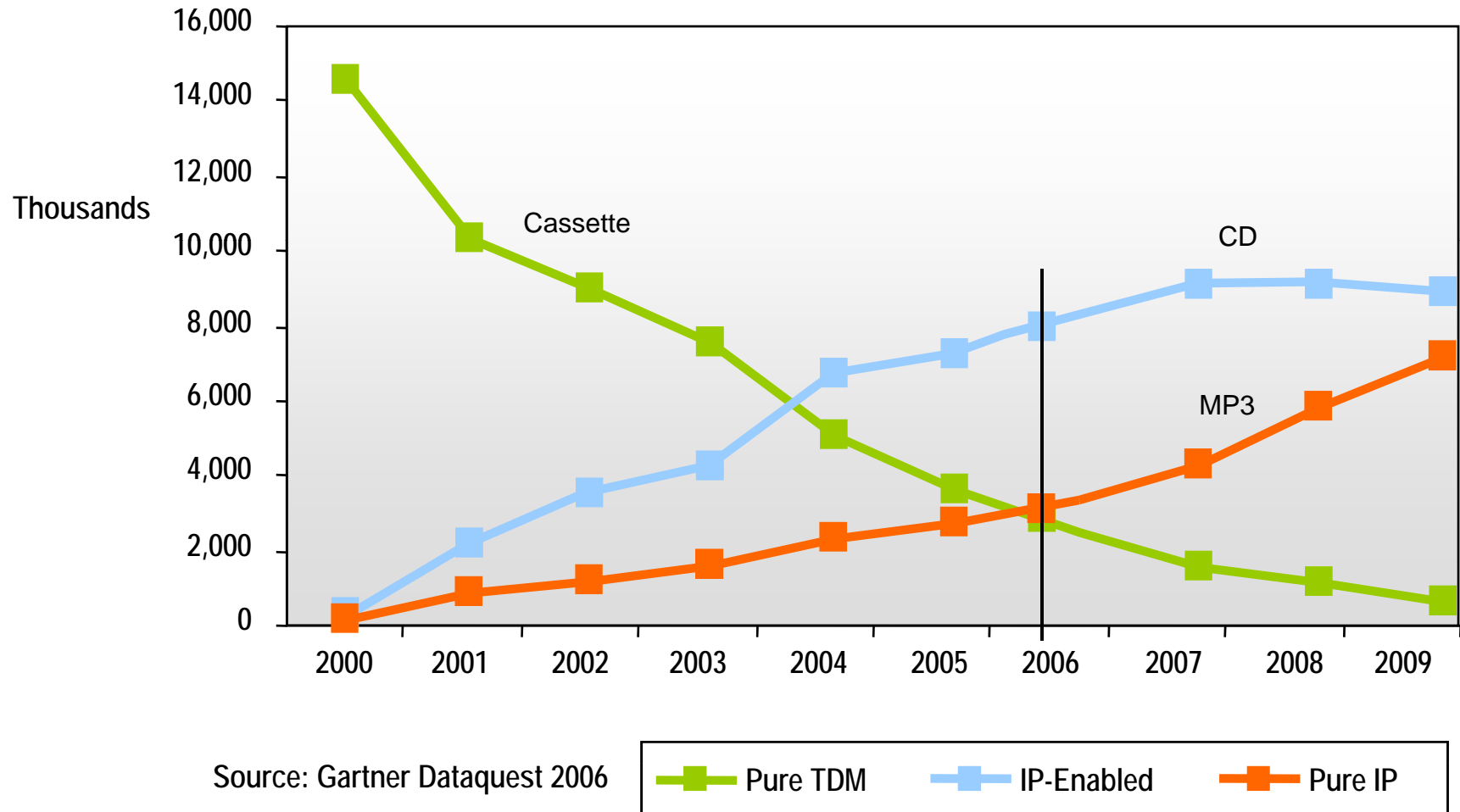


# State of the Telecom Industry

Is the Market Learning, Looking  
or Buying?

# Business Telephony Shifting to Pure IP

## Line Shipments to North American Enterprises





# VoIP Vs. IP Telephony

- Form Vs. Function
- VoIP is the medium to transfer data, voice
  - VoIP is a generic term for using IP data networks like the public Internet to transmit voice traffic. VoIP has promised consumers savings by transmitting calls over the Internet, bypassing traditional phone companies.
- IP Telephony is an application over an infrastructure



# New Buying Criteria for New Technology

## Traditional Telephony

- Purchase Price =>
- Phone Features =>
- Legacy Reputation =>

## IP Telephony

- Total Cost of Ownership
- Applications
- Architecture

# Business Goals of IP Telephony

- Reduce Operational Expenses



- Improve Employee Productivity



- Revolutionize Customer Service





# Motivation for IP Telephony

## Improved Economics (Hard \$\$)

- **Return on Investment/Total Cost of Ownership reduction**
- **Simpler Administration (Moves/Adds/Changes)**
- **Standards-based systems (vs. \$\$\$ Proprietary Legacy PBXs)**
- **Consolidated Network (No Separate Voice/Data Networks)**
- **Lower Toll Costs (Network Call Routing)**
- **Reliability and Scalability**



## Motivation for IP Telephony

### Improved Performance (Soft \$\$)

- **Increased flexibility and efficiency for your Internal Customers**
- **Easier Integration with Advanced applications**
- **Improved Organizational Integration**



# Technology Disruption example: Computing

- In 1980:
  - **Wang, DEC, Burroughs, Sperry, and Data General** were large successful companies
  - Michael **Dell** was in high school, **Microsoft** was a 4 person company and **Cisco** and **Compaq** didn't exist.



## Choices Available to Decision Makers

- **Managed IP Services**

- Open source

- **Bolt-on Technology**

- IP gateway cards are added to a legacy PBX or voice components added to a router

- **Pure IP Telephony**

- Traffic is routed over a LAN / WAN and switched using call control software on a server or appliance

- **Converged PBXs**

- IP, digital and /or analog stations can be connected to a single system



# Moving Towards IP Telephony

Real or Imagined Concerns



# Insightful Statistics

- **AMI Research Company polled 512 SMB (20-499) owners**

- Avg. 2.4 sites with 38% being single site
- 46% expect to open new location in 12 months
- 74% offer some form of telecommuting
- 84% have IT staff who handle voice and data systems

- **Trust:**

- 54% want long term partner relationship
- 80+% will listen to partner's recommendation
- 73% will choose partner through customer reference



# Insightful Statistics

- **Convergent Worries:**

- 48% say too costly
- 28% say too complex to deploy
- 26% say too complex for end-user
- 22% say VoIP unreliable

- **Network Issues:**

- 74% say network assessment is required
- 20% believe network requires major upgrade
- 55% believe network requires minor upgrade



# Insightful Statistics

## ■ Drivers of purchase:

- 94% focused on Price/TCO
  - Speaks directly to deployment issues
- 88% focused on Support issues
  - Is support local or outsourced?
- 79% looked for ROI value
  - Price not on Day 1 but on Day 1,000
- 74% sought a scalable product
  - What size box do I buy? Forklift upgrades later?
- 67% Brand Shoppers
  - Am I making a safe choice or the right choice?



# Choosing a Vendor

## ■ Legacy vendor who now does IP

- Pro: Good feature set
- Con: Expensive to link multiple sites, same difficult programming interface, same pricing structure

## ■ Innovation Through Acquisition

- Pro: Best of Breed telephony buyer
- Con: Difficult to integrate all acquisitions, multiple databases to maintain, multiple servers and interfaces

## ■ Organic

- Pro: Started from a clean sheet of paper so could design around legacy pitfalls, IP at the core so integration is easier to network, typically standards based
- Con: Name recognition



# Moving to IP Telephony

Being Proactive with Your  
Network



# Network Assessments

- Review calling requirements to ensure the network is capable of supporting Voice
- Plan for testing well before planned implementation date to ensure there is time to make adjustments to the network
- Perform extended testing ( with simulated voice traffic ) to either prove network is ready, or provide recommendations for improvement
- Networks change over time. Create a long term network health strategy



# Network Assessments

- Sample test calls between “traffic agents”
  - Concept is to view readiness of network for voice
- Key Indicators
  - MoS (Mean Opinion Score)
    - 3.6 and higher for acceptable quality
  - Jitter, Latency & Packet Loss

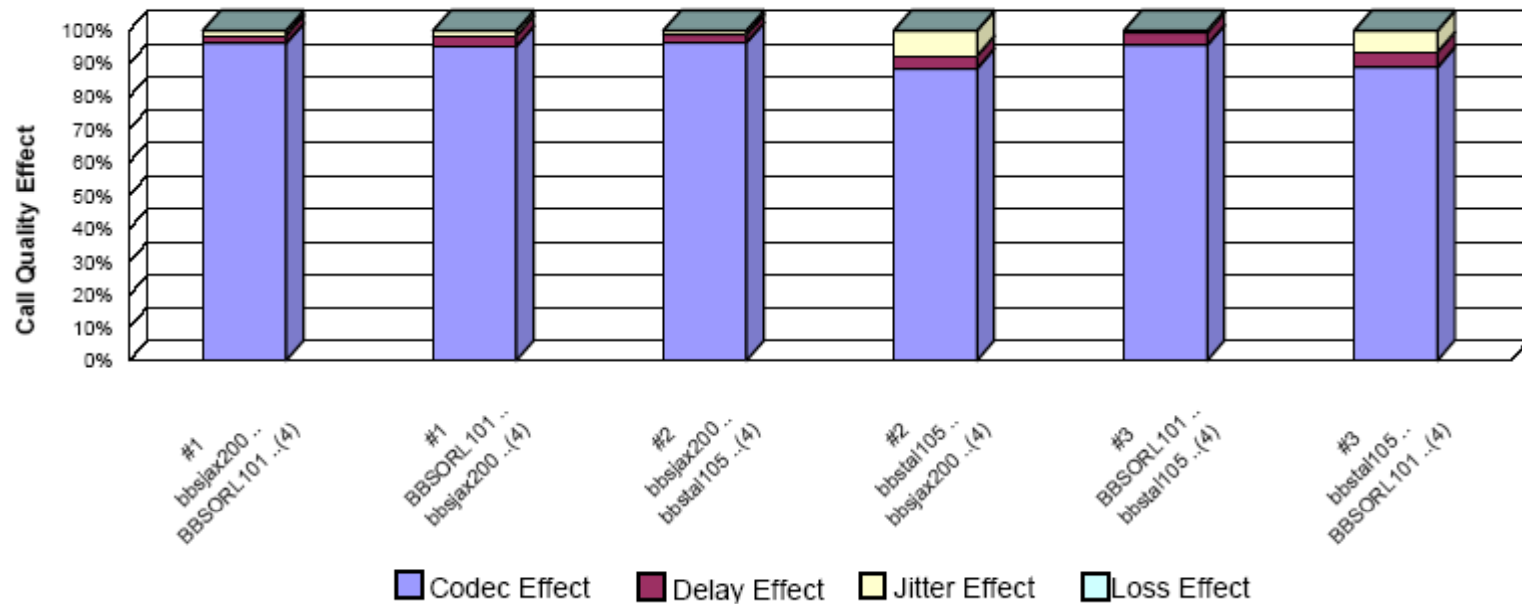


# Results Between Agents

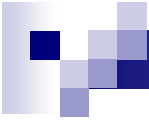
Traffic Agent Pairs	Evaluated Calls	MOS	Codec
bbsjax200 - A - 192.168.1.103- BBSORL101 - B - 192.168.100.120	4	4.1	G.729
bbsjax200 - A - 192.168.1.103- bbstal105 - C - 192.168.5.111	4	4.1	G.729
BBSORL101 - B - 192.168.100.120- bbstal105 - C - 192.168.5.111	4	4.1	G.729

What can we infer?

# Daily Results

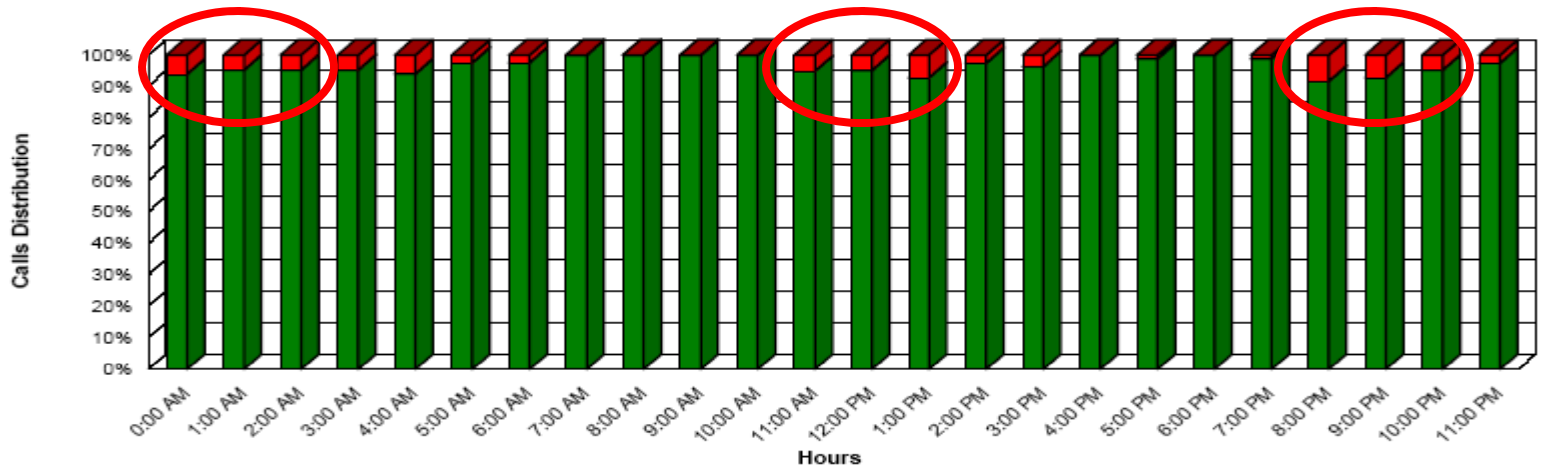
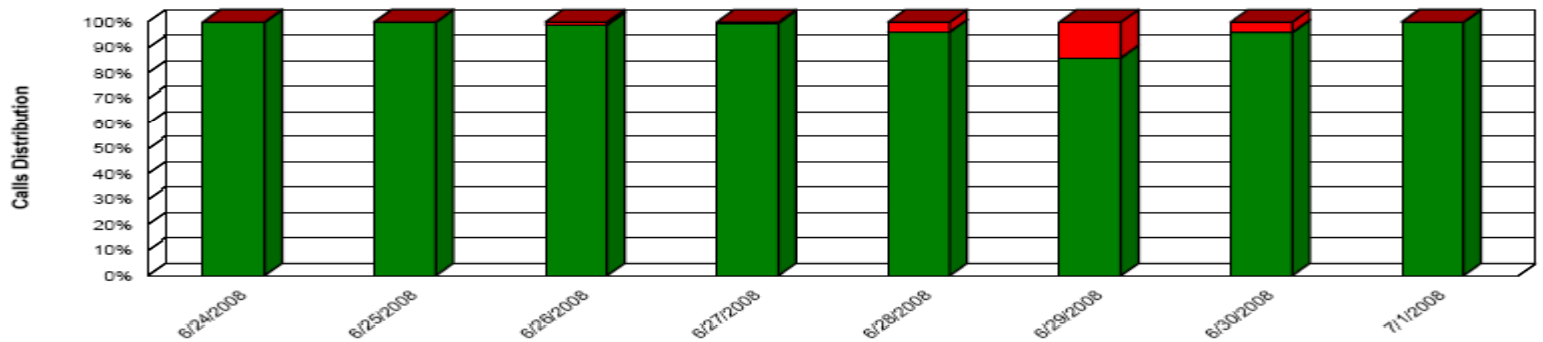


OK, but what does it mean?



# Hourly Results

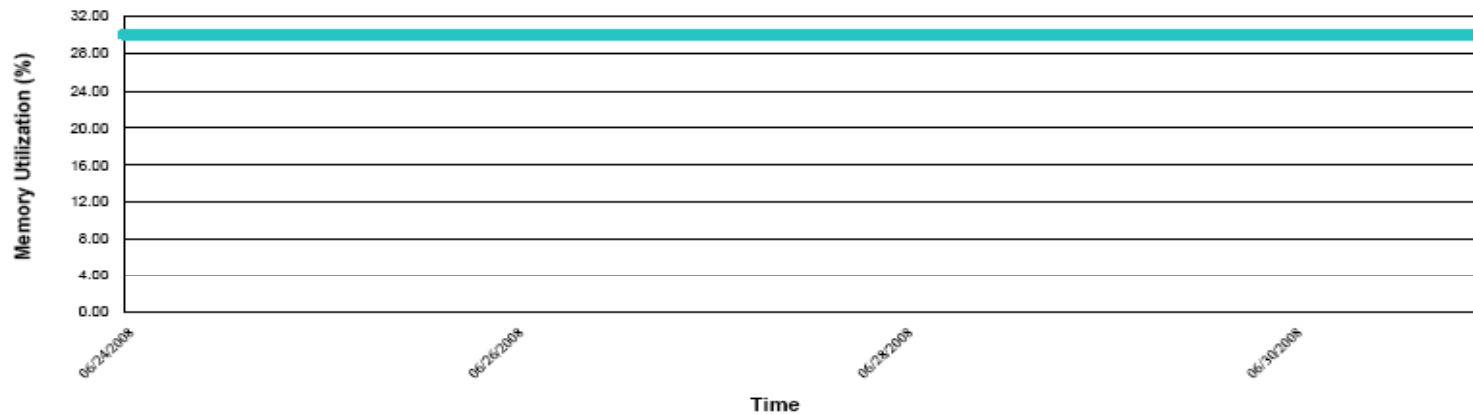
The following chart illustrates the call distribution - percentage of bad and good calls





# Router Performance Comes Into Play

The charts below illustrate the average memory, CPU, inbound and outbound interface utilization, along with the corresponding thresholds, for the router with IP address 172.16.0.1.





# Final Results

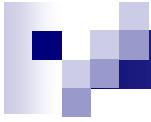
Measurement	Good	Acceptable	Poor
MOS	Above 4.0	4.0 to 3.6	Below 3.6

Measurement	Good	Poor
Delay (msec)	Below 150	Above 150
Jitter (msec)	Below 30	Above 30
Loss (percent)	Below 1	Above 1

Where do we stand?

# WAN Assessment

Traffic Agent Pairs	Recommended Number of Calls	MOS	Codec
Garden Grove - B- Lakewood - C	14	4.1	G.729
Garden Grove - B- Ontario - D	14	4.1	G.729
Garden Grove - B- Perris - E	28	4.1	G.729
Garden Grove - B- Temecula - F	28	4.1	G.729
Garden Grove - B- Santa Fe - G	28	4.1	G.729
Garden Grove - B- Corona - H	28	4.1	G.729
Garden Grove - B- Irwindale - I	28	4.1	G.729
Garden Grove - B- Anaheim - J1	28	4.0	G.729
Lakewood - C-Ontario - D	14	4.1	G.729
Lakewood - C-Perris - E	35	4.1	G.729
Lakewood - C-Temecula - F	35	4.1	G.729
Lakewood - C-Santa Fe - G	28	4.0	G.729
Lakewood - C-Corona - H	35	4.1	G.729



# Exercise: Your Phone System Today

The Good	The Bad
The Ugly	Wish List