



IP Contact Centers: Killer Application for VoIP?

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INTEROP[®]

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- Why IP Contact Centers? Costs, Applications, ...
- The quality perspective: Risks and Challenges
- Measurements and Metrics
- Tips – preparing for IP Contact Center Deployment

What Drives Contact Center Spending

(2005 global revenue)

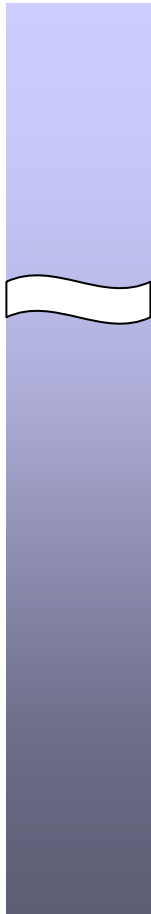
Customer Contact Value ~\$300B

(Source: Jupiter)



Contact Center Spend ~\$50B

(Source: Datamonitor)



IT spend in Contact Centers ~ \$15B

(Source: Datamonitor)



- 85% contacts over the phone, despite growing push to web
- ~55M phone contacts/yr; ~\$60/contact average value (20-1000+)
- Contact volume and caller expectations rising

- ~\$8/contact avg spend, decreasing with more voice self-service
- 30% on IT, 10% on network services, 60% on labor

Contact Center Equipment Spend ~\$7.5B

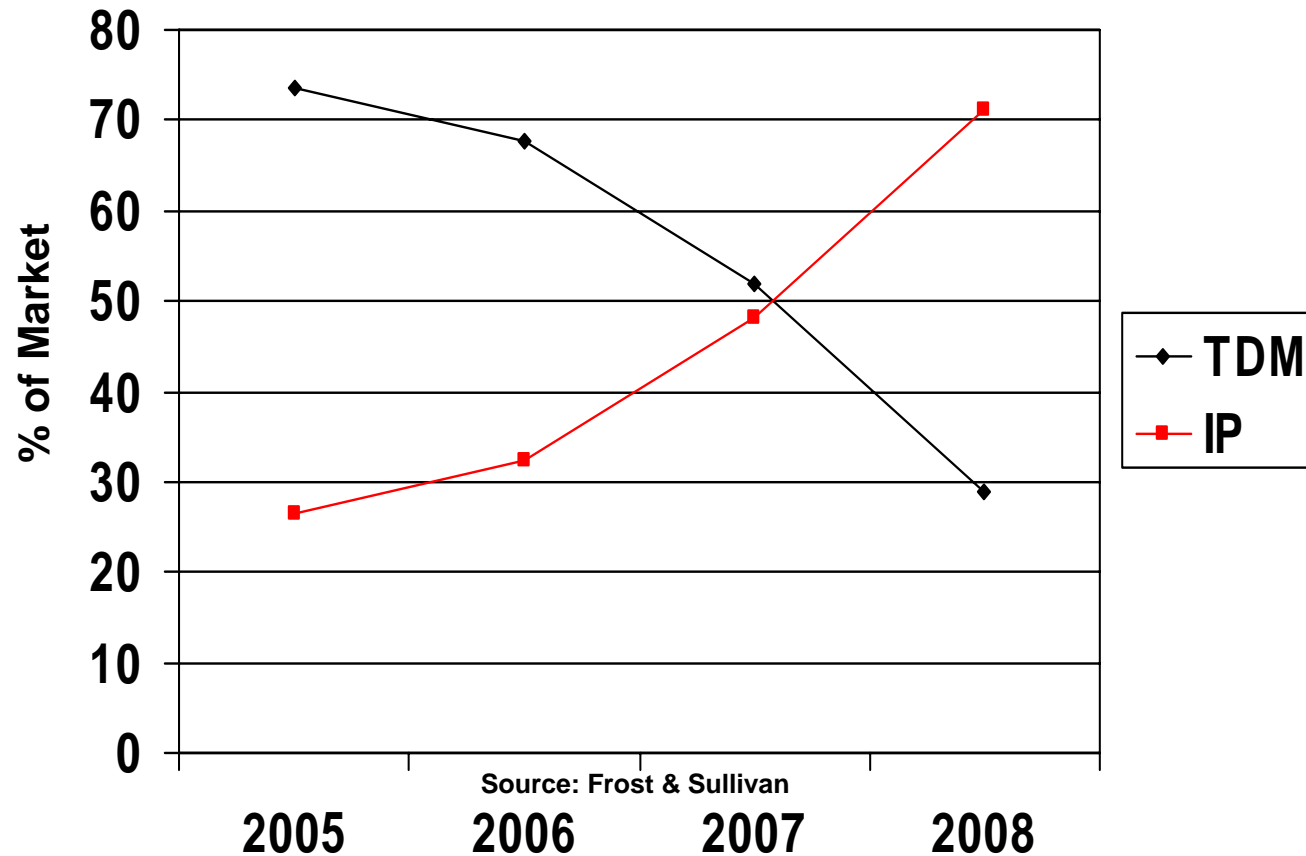
(Source: Datamonitor, Frost & Sullivan)

- WorkForce Mgmt, Call Monitoring, Wallboards, ... ~\$1.5B
 - Manage the people
- ACD, IVR, CTI (screen-pop & routing), Speech, Services ~\$6B
 - Manage calls, avoid labor where possible

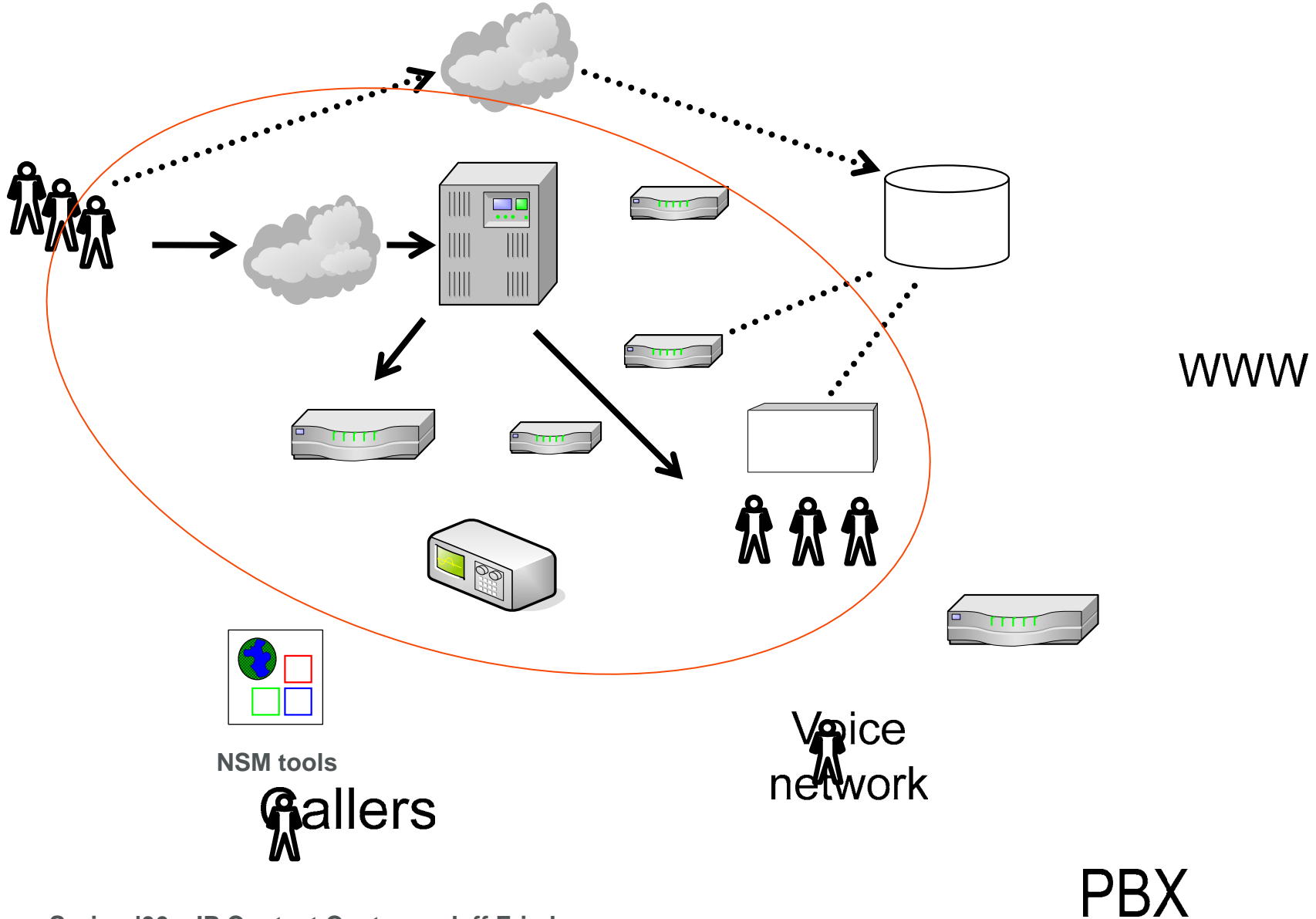
CRM spend ~\$7.5B in Contact Centers (~\$16B overall)

(Source: Datamonitor, Reuters)

North American Contact Center Market Growth of New Agent Seats: IP vs TDM



Defining IP Contact Centers: Anatomy of a Call Center



TDM Solutions



VoIP Solutions

- Voice Encoding
 - G.711 (ulaw/alaw)

- Circuit Switched
- Signaling Protocols
 - SS7, ISDN

- PSTN Switches
- Private Branch Exchange

- Analog/Digital Telephones

- Codecs
 - G.723, G.726, G.729

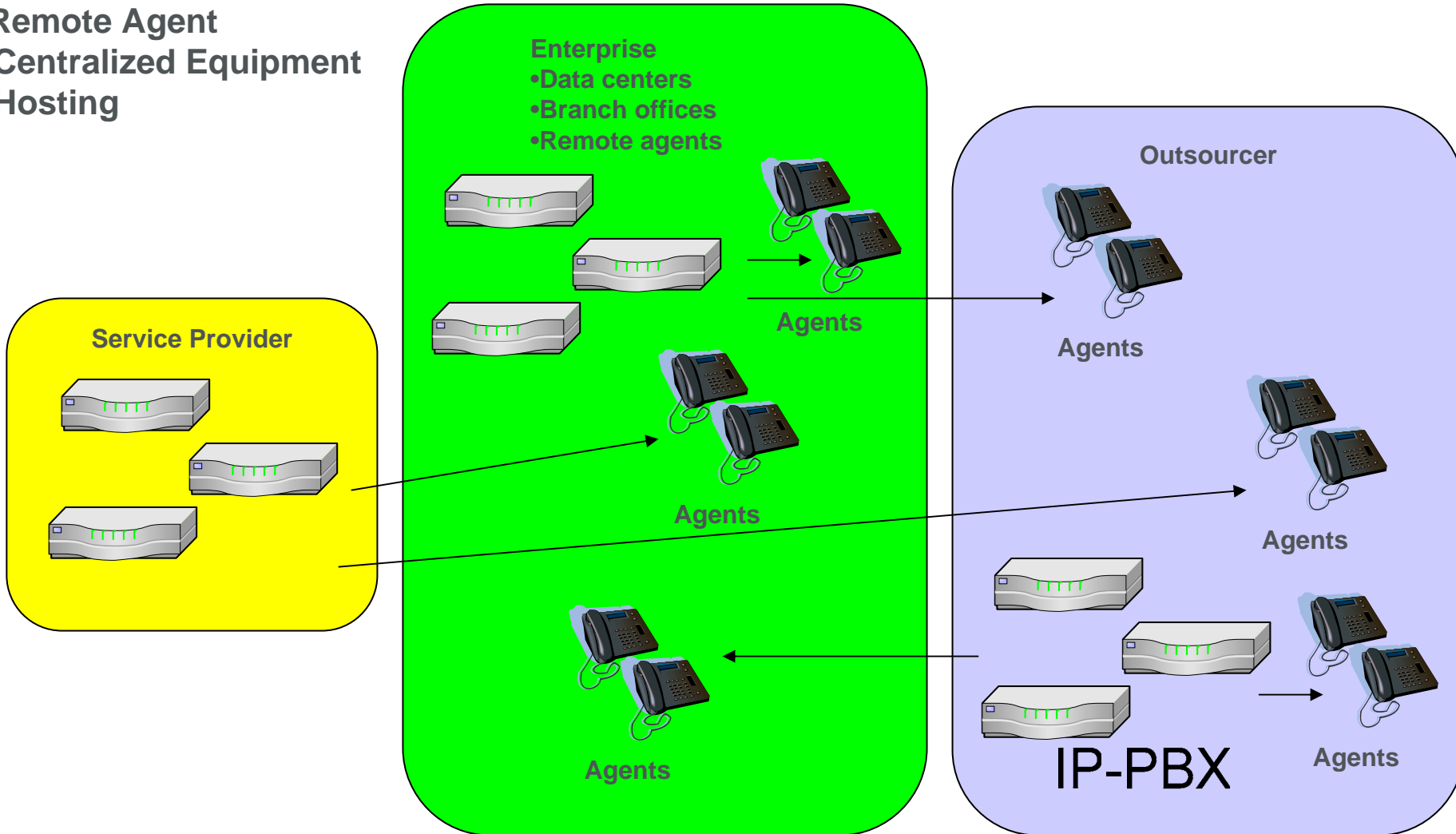
- Shared Data/Voice Network
- TCP/IP and VoIP Protocols
 - SIP, H.323, SCCP, MGCP, Megaco

- VoIP Gateways and Routers
- IP Telephony Servers
 - IP-PBX Clusters
 - IP Telephony Services

- IP Phones and softphones

IP Contact Center Benefits: Configuration Flexibility

- Remote Agent
- Centralized Equipment
- Hosting



Are IP Contact Centers driven by New Applications?

SAME OLD applications, made more practical and more real:

- Routing
- Reporting
- Dialing
- Recording/Logging
- Disaster Recovery
- IVR & Speech
- CTI
- CRM
- Remote Agent
- Click-to-talk
- Tapping non-agents
- Multi-channel
- Unified Messaging
- Collaboration with callers
- Video
- Wireless Agents
- Presence / IM / personal rules
-

Actually new:

- Presence from callers
- “Situational” Logging
- Location (“breadcrumbs and geofences”)

Dramatically changed

- Multi-site contact centers
- Outsourcing, Homesourcing
- Costs and Complexity

Quality encompasses most of the “-ities”

- Reliability
- Usability
- Manageability
- Scalability
- Supportability
- Security
- Availability
- Performance
- Extensibility
- Maintainability

these are attributes of a system; they do nothing by themselves

IP is a “how” rather than a “what”

There are MANY quality implications of IP Contact Center approaches, both positive and negative

- “General VoIP” quality risks: voice quality, manageability, security, troubleshooting, IT skill set
- Interoperability, more multi-vendor risks
 - Technology and standards are still evolving fast
- Failover and continuity with centralized IP-PBXs
- Generally more moving parts & more boxes
- More vulnerable to infrastructure down time
 - Make sure you have a rock-solid converged data network
- More frequent new releases
- Wider variation in caller “technology” variety
- People management
 - At-home agents, single multi-site queues, outsourcers...

Common Pitfalls and Issues during IP Contact Center Deployment

- ❖ Lack of organizational readiness
 - Need for Infrastructure and Application responsibilities
- ❖ VoIP is “just another application on the network”
 - Provide staff cross training and tools
- ❖ Expecting telephony-grade support
 - Plan to test and system management
- ❖ Depending on single-shot network assessment
 - Test with actual VoIP traffic to detect misconfigurations
- ❖ Focus on infrastructure only, not applications
 - Focus on Packet-Level, Call-Level, Application-Level testing
- ❖ Lack of lifecycle view
 - View deployment as set of concrete phases

Main Quality Focus Areas for VoIP today

⇒ **Ensuring voice quality**

⇒ **Ensuring that new applications perform smoothly on VoIP infrastructure.**

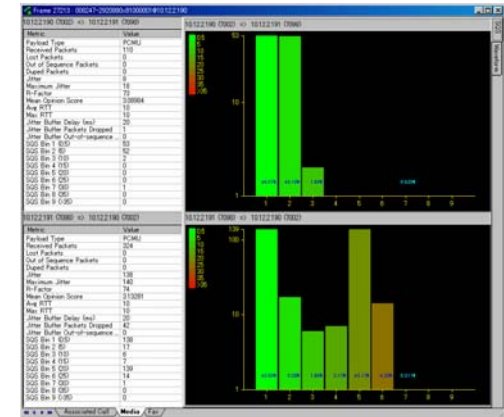
⇒ **Ensuring the ability to troubleshoot**

Still a critical need for enterprises

- Look at all the metrics of RTP exactly as transmitted on the network
- Understand the end user's experience
- Become proactive about problem prevention

Metric	Value
Payload Type	PCMU
Received Packets	324
Lost Packets	0
Out of Sequence Packets	0
Duped Packets	0
Jitter	138
Maximum Jitter	140
R-Factor	74
Mean Opinion Score	3.13281
Avg RTT	10
Max RTT	10
Jitter Buffer Delay (ms)	20
Jitter Buffer Packets Dropped	42
Jitter Buffer Out-of-sequence ...	0
SQS Bin 1 (0.5)	138
SQS Bin 2 (5)	17
SQS Bin 3 (10)	6
SQS Bin 4 (15)	7
SQS Bin 5 (20)	139
SQS Bin 6 (25)	14
SQS Bin 7 (30)	1
SQS Bin 8 (35)	0

- Packet Loss ?
- Jitter?
- Delay ?
- Voice Quality?
- MOS and R-Factor



Jitter distribution graph

Measurement is critical for problem resolution

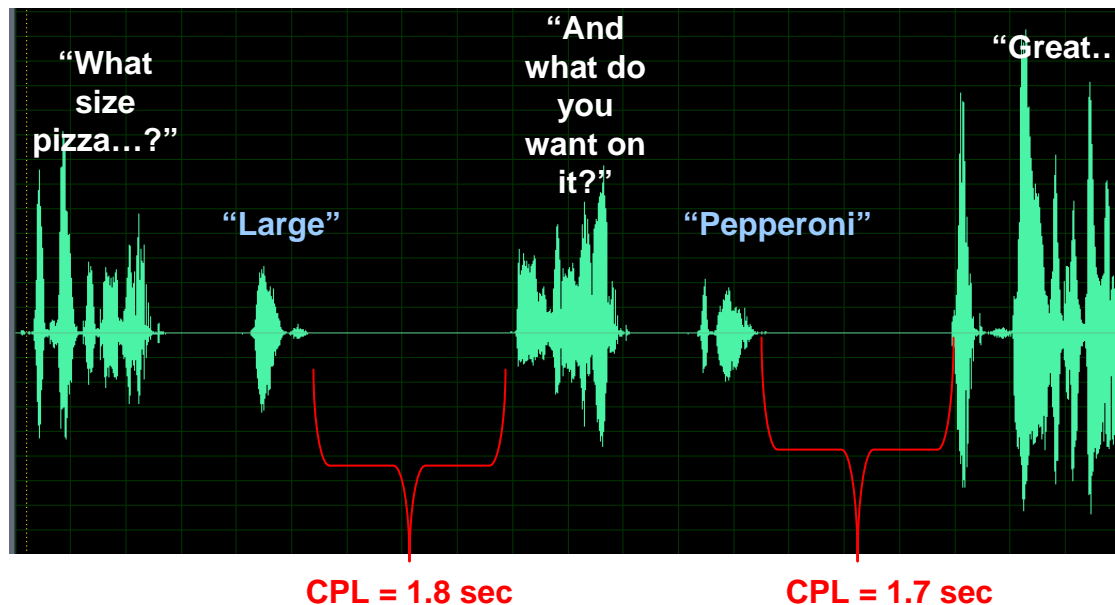
- Signaling latency (speed of dial tone, speed of call transfer, etc.),
- Reliability of application information delivery (screen pops, information elements use for routing, etc.),
- Application performance (IVR responsiveness, Application performance under load, etc.)
- Impact of VoIP on applications (speech recognition accuracy with packet loss, conference bridge loudest-speaker detection, etc.)
- All-paths testing (correct configuration of all forwarding, hunting, routing, voicemail and messaging configuration, etc.)



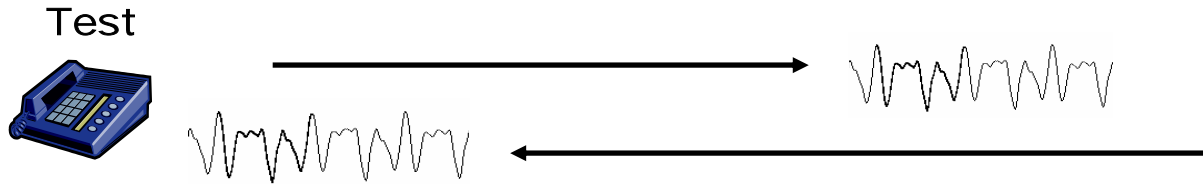
- Larger queues are much more efficient
 - 1 group of 70 can match 10 groups of 10 = 30% savings!!!
- Historical Tension: effectiveness vs efficiency
 - Specific skills vs larger groups -> multi-skill assignments help
- Multiple levels of queuing (pre- and post-) less effective than a complete view
- IP contact centers can provide a centralized control point without multiple levels, network TB&T, etc.

An Important Metric: Customer Perceived Latency (CPL)

- the length of time between the end of a caller's input and the successful response from the system, as perceived by the caller
- a crucial element of usability and the customer experience that is directly tied to application performance



Testing scenarios - Stimulus / Response through application call flow



□ *Prompt Identification*

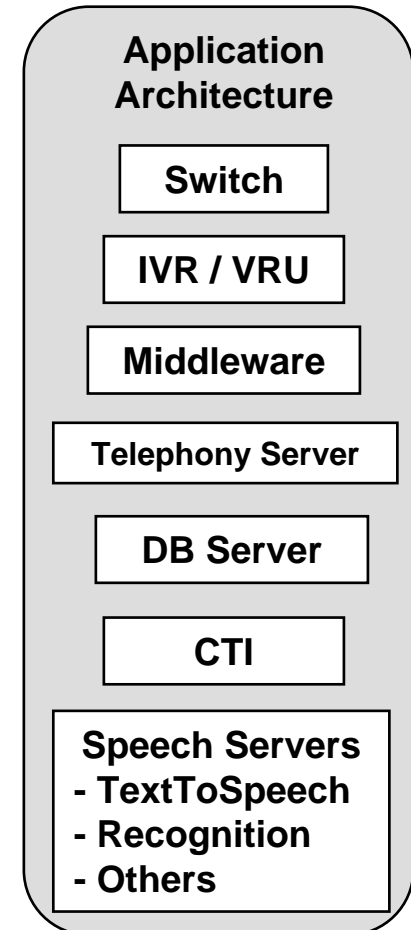
- Was the correct prompt delivered?
- Are alternate prompts allowed?
- What is the quality of the delivered prompt?

□ *Prompt Metrics*

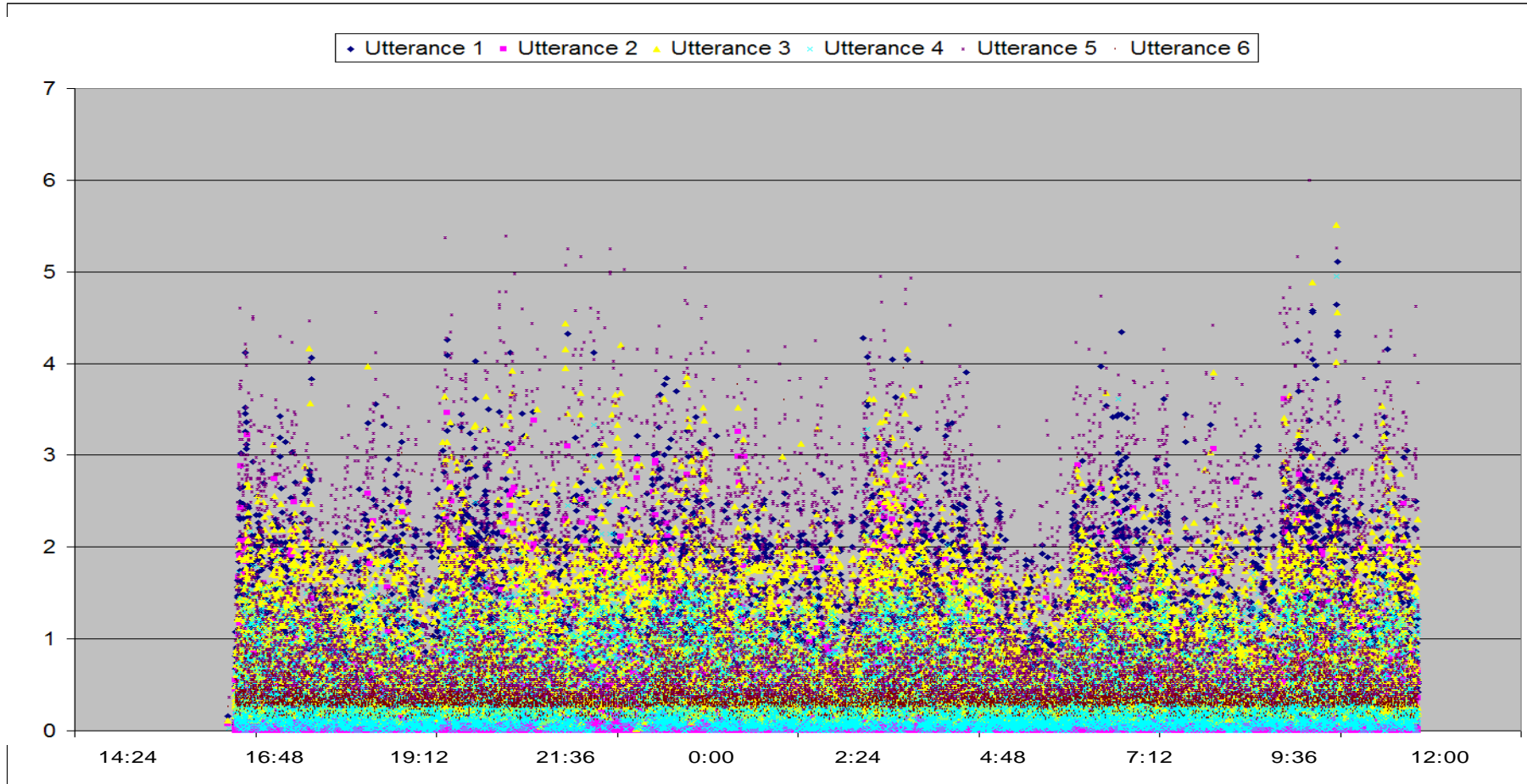
- Response Time – how quickly is the prompt delivered
- Response Length – how long is the delivered prompt

□ *Data Validation*

- What information was delivered?
- Was the information correct?
- What is the speed of screen pops?

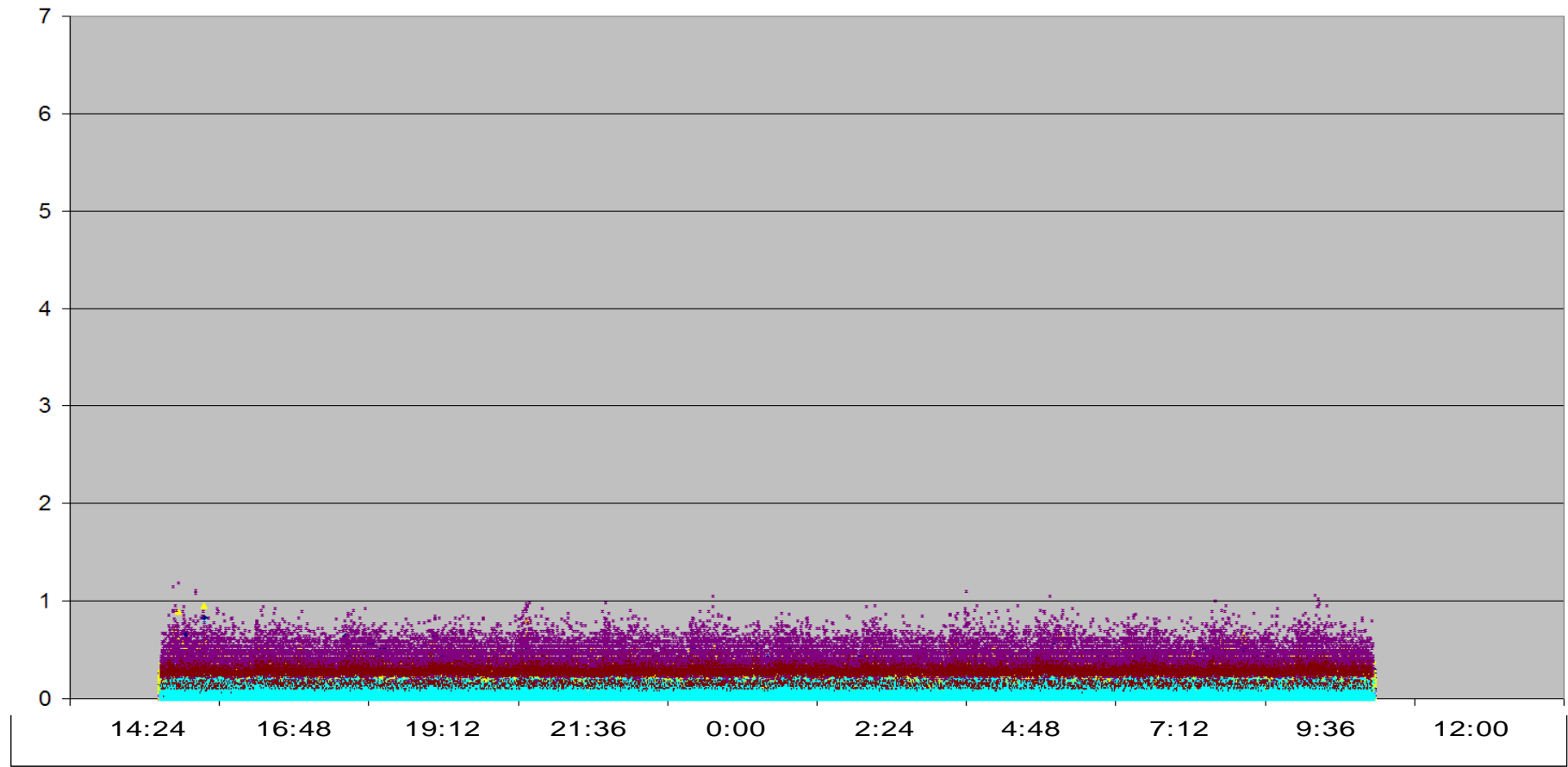


IP-IVR "Before" - intermittent BIG delays under load



"After" - speedy performance - just by rearranging processes

◆ Utterance 1 ■ Utterance 2 ▲ Utterance 3 × Utterance 4 · Utterance 5 · Utterance 6



Preparing for IP Contact Center Deployment

- Train someone on your staff about IP contact center technologies. If possible, establish a lab for evaluation, benchmarking, troubleshooting, and training. Equip it with representative versions of your deployment configuration, and with good testing and troubleshooting tools.
- Review options for system management. Try to roll out system management tools and processes that work throughout your migration process.
- If you haven't done so, establish an overall direction for your contact center, including technology direction, and then define priorities and timeframes for completion. It is not necessary to build a business case for new technologies up front, but it is important to do so as you near the timeframe for adoption.
- If you think that work-at-home or remote agents are in your future, start a pilot now. Identify a top-notch employee with an interest in telecommuting and initiate the arrangement.
- Look over business continuity plans for your contact center. If you don't have a plan in place, you should, and IP contact centers can provide a powerful way to insure yourself against disasters.

- ❖ IP Contact Centers DO work
 - Big benefits in flexibility of configuration
 - Few truly new applications, but can be much more practical
- ❖ Many quality implications
 - Positives: business continuity, centralized management,
 - Negatives: VoIP challenges, emerging technology & standards, more moving pieces
- ❖ Does not change many of the challenges for running a contact center
 - Provides many more options, and makes managing the technology more important
- ❖ Queuing metrics and CPL will become more important

Empirix delivers testing and management solutions to ensure performance and reliability of business-critical applications.

VoIP and Enhanced Services



Web Applications



Contact Center Voice & Agent Applications

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