



Today's Webinar:

Understanding Your Competitors & Managing Partner Relationships

November 16, 2010

Today's Agenda

1. Introductions & Keynote Overview
2. Leveling the Playing Field
3. Partner & SLA Management
4. Improving Troubleshooting Effectiveness
5. Q & A/Wrap-up

Keynote Systems Overview



“Software On Demand”

- Founded 1995, public in 1999 (NASDAQ: KEYN)
- 2,600 corporate customers
- 40+ distributed testing and monitoring services
- **“On demand, hassle free service on highly reliable platform”**



Unique Solutions

- **Mobile** - Improve mobile data services and content delivery
- **Strong Mobile Portfolio** – MDP, MAP, and SIGOS solutions.
- **VoIP and Streaming** - Accelerate services rollout and ensure service quality
- **Web** - Improve online experience and site performance

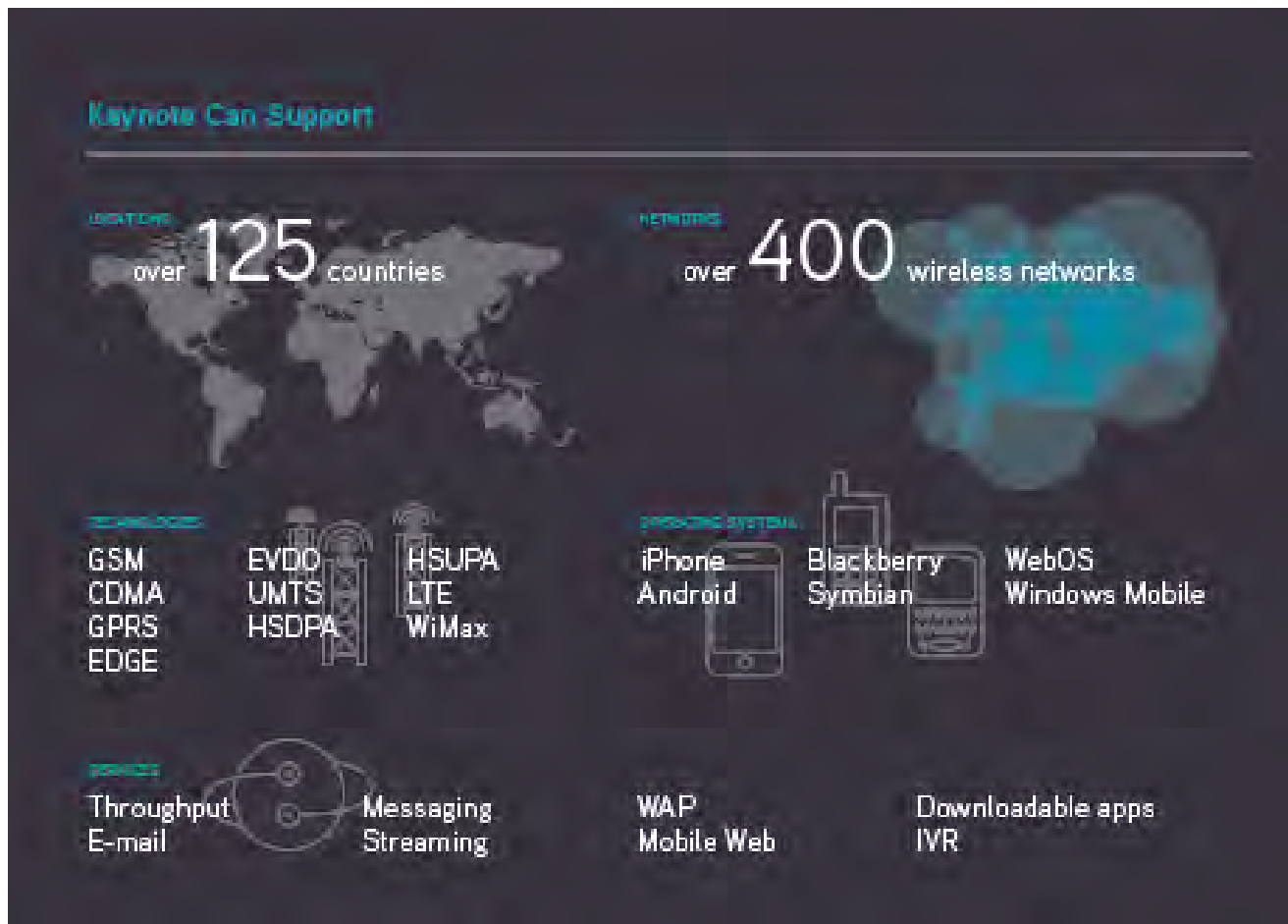


Unique Capabilities

- **The “Keynote Network”**
 - 240 locations worldwide
 - 3,000 measurement computers and mobile devices
 - 160 metropolitan cities worldwide
 - Rapid deployment of web and mobile agents.
 - 120 Million measurements each day

Keynote Can Support Your Mobile Needs

The locations, networks, technologies, operating systems, and services that matter most.



Solutions for:

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- ❖ Service Delivery Assurance
- ❖ SLA Management
- ❖ Competitive Benchmarking
- ❖ Remote Troubleshooting and Diagnostics

Today's Agenda

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Leveling the Playing Field (the “Secret” of Success)

The “Secret” is....there is no secret!

- ❑ Identify drivers of customer behavior.
- ❑ Understand your strengths & weaknesses.
- ❑ Understand your competition.
- ❑ Target marketing and/or network enhancements to take advantage of opportunities.

Quality - the Main Driver of Customer Behavior

Quality of Service from the end user view has become the battleground in the fight for mobile subscribers.

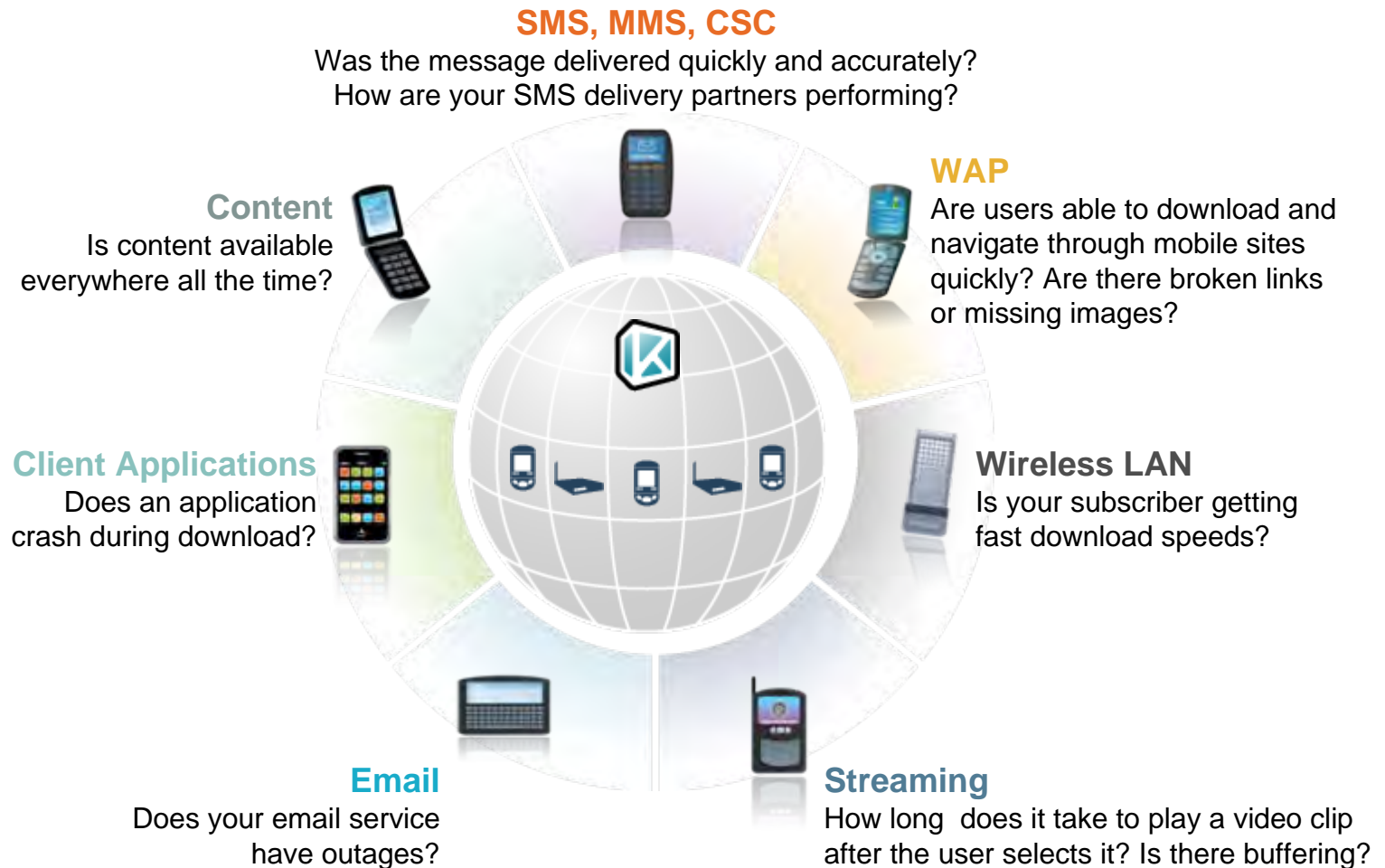
“Nation’s Fastest 3G Network”

“Most Reliable”

“Can you hear me now?”

“It’s the Network”

The Complex Challenge of Meeting User Expectations



Understand Your Strengths & Weaknesses

At a core level, monitoring and competitive benchmarking help you answer a couple of key questions.

Key Question #1

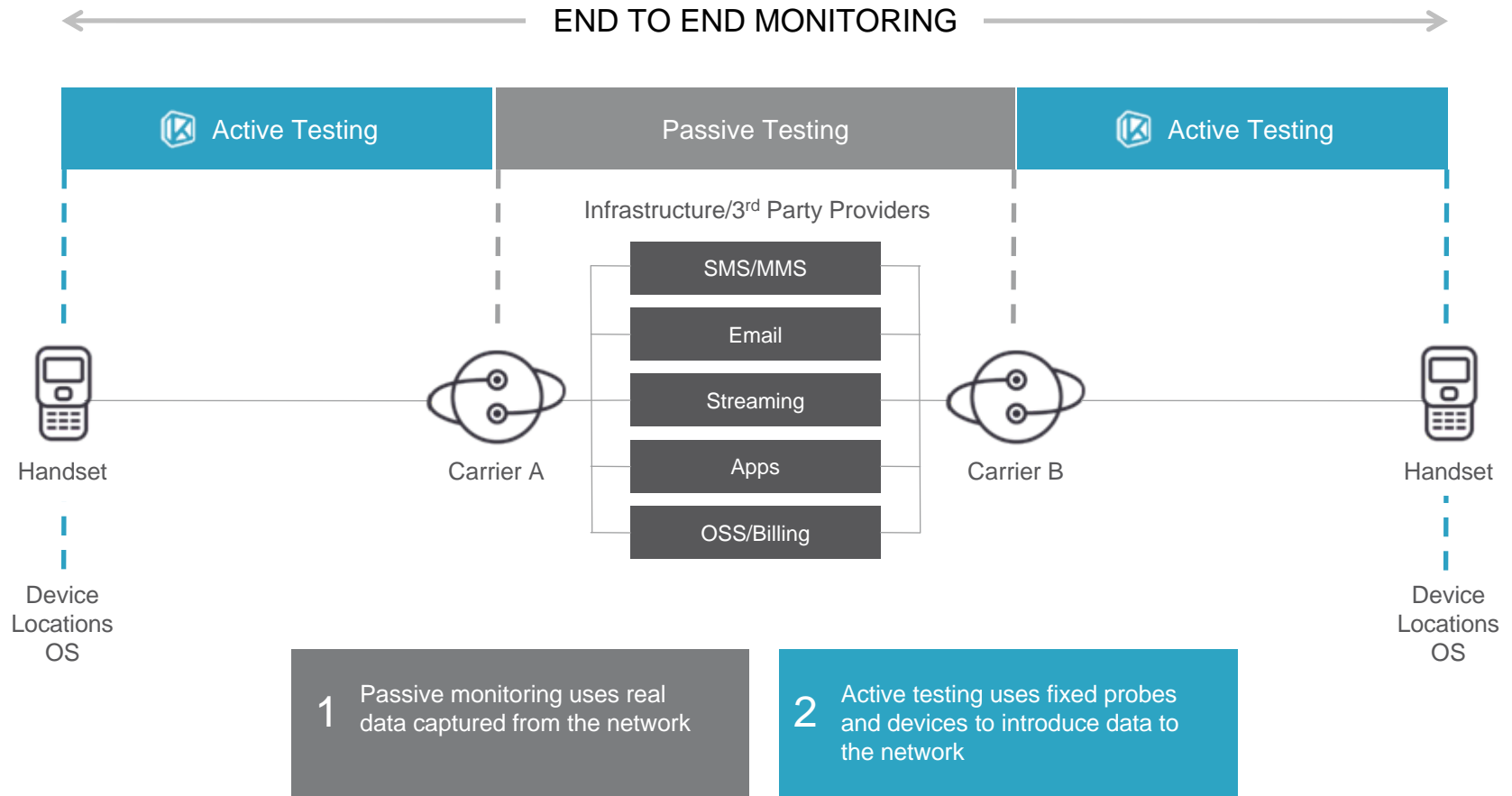
How am I doing?

Delivering World Class Services

Proactive ideas for success

1. Monitor core services and benchmark against industry leaders
 - Data throughput
 - SMS
 - MMS
 - Streaming
 - WAP
2. SLA Management for alarming and compliance
3. Real-time diagnostics strategies that reduce mean time to repair

Active Testing Complements Passive Monitoring



Underlying Technology:

Multiple methods for collecting raw data

Consumer Handsets

- Client Application Monitoring
- True End User Experience (End to End)
- Spread testing between agent and handset
- Smartphone Support



Wireless Data Probes

- Robust Design for Volume Testing
- Deeper Visibility into Network Stack
- SIM multiplexer for Roaming
- Server Based Services



SMS - Market Level Data

| Sprint | SMS Send | | | SMS Receive | | | Overall | | | Samples |
|----------|-------------------|------------------------|------------------------------|--------------------|------------------------|------------------------------|--------------------|------------------------|------------------------------|---------|
| | 60 second timeout | | | 180 second timeout | | | 180 second timeout | | | |
| | Success Rate (%) | Average Time (seconds) | Standard Deviation (seconds) | Success Rate (%) | Average Time (seconds) | Standard Deviation (seconds) | Success Rate (%) | Average Time (seconds) | Standard Deviation (seconds) | |
| Chicago | 99.18% | 3.37 | 2.15 | 99.59% | 4.89 | 2.92 | 98.78% | 8.26 | 3.58 | 735 |
| Dallas | 99.89% | 3.20 | 0.35 | 99.78% | 7.27 | 1.67 | 99.67% | 10.47 | 1.69 | 912 |
| New York | 100.00% | 3.12 | 0.10 | 100.00% | 6.64 | 1.55 | 100.00% | 9.77 | 1.55 | 740 |
| Seattle | 100.00% | 3.16 | 0.22 | 99.70% | 7.48 | 3.40 | 99.70% | 10.64 | 3.39 | 661 |

| Success Rate (60 sec) | Send Time | Send Variability | Success Rate (180 sec) | Receive Time | Receive Variability | Overall Success Rate | Overall Average Time | Overall Variability | Samples |
|--|--|--|--|--|--|--|--|--|---------|
| Green ≥ 99.5% Yellow > 99% - < 99.5% Red ≤ 99% | Green ≤ 5 Yellow > 5 - ≤ 10 Red ≥ 10 | Green ≤ 1 Yellow > 1 - ≤ 5 Red ≥ 5 | Green ≥ 99.5% Yellow > 99% - < 99.5% Red ≤ 99% | Green ≤ 5 Yellow > 5 - ≤ 10 Red ≥ 10 | Green ≤ 10 Yellow > 10 - ≤ 15 Red ≥ 15 | Green ≥ 99.5% Yellow > 99% - < 99.5% Red ≤ 99% | Green ≤ 10 Yellow > 10 - ≤ 20 Red ≥ 20 | Green ≤ 10 Yellow > 10 - ≤ 15 Red ≥ 15 | |

| Sprint Market | Overall | | | Overall Timings | | | Reliability Issues | | Samples |
|---------------|-------------------------|------------------------|------------------------------|------------------|------------------|------------------|--------------------|-------------------|---------|
| | Success Rate (180s) (%) | Average Time (seconds) | Standard Deviation (seconds) | < 20 seconds (%) | < 40 seconds (%) | < 60 seconds (%) | ≥ 60 seconds (%) | Lost Messages (%) | |
| Chicago | 98.78% | 8.26 | 3.58 | 97.96% | 99.05% | 99.59% | 0.41% | 0.00% | 735 |
| Dallas | 99.67% | 10.47 | 1.69 | 99.67% | 99.78% | 99.78% | 0.22% | 0.00% | 912 |
| New York | 100.00% | 9.77 | 1.55 | 100.00% | 100.00% | 100.00% | 0.00% | 0.00% | 740 |
| Seattle | 99.70% | 10.64 | 3.39 | 99.09% | 99.24% | 99.70% | 0.30% | 0.00% | 661 |

| Success Rate (180 sec) | Overall Time | Overall Variability | < 20 seconds | < 40 seconds | < 60 seconds | ≥ 60 seconds | Lost Messages | Samples |
|--|--|--|--|--|--|--|--|---------|
| Green ≥ 99.5% Yellow > 99% - < 99.5% Red ≤ 99% | Green ≤ 10 Yellow > 10 - ≤ 20 Red ≥ 20 | Green ≤ 10 Yellow > 10 - ≤ 15 Red ≥ 15 | Green ≥ 95% Yellow > 90% - < 95% Red ≤ 90% | Green ≥ 95% Yellow > 90% - < 95% Red ≤ 90% | Green ≥ 95% Yellow > 90% - < 95% Red ≤ 90% | Green ≤ 2% Yellow > 2% - < 5% Red ≥ 5% | Green ≤ 0.75% Yellow > 0.75% - < 1.50% Red ≥ 1.50% | |

MMS - Market Level Data

| Verizon Market | MMS Send | | | MMS Notification | | | MMS Retrieve | | | Overall | | | Samples |
|----------------|--------------------|------------------------|------------------------------|--------------------|------------------------|------------------------------|--------------------|------------------------|------------------------------|--------------------|------------------------|------------------------------|---------|
| | 180 second timeout | | | 300 second timeout | | | 180 second timeout | | | 300 second timeout | | | |
| | Success Rate (%) | Average Time (seconds) | Standard Deviation (seconds) | Success Rate (%) | Average Time (seconds) | Standard Deviation (seconds) | Success Rate (%) | Average Time (seconds) | Standard Deviation (seconds) | Success Rate (%) | Average Time (seconds) | Standard Deviation (seconds) | |
| Chicago | 88.40% | 12.28 | 19.10 | 98.42% | 11.79 | 14.80 | 100.00% | 10.88 | 2.27 | 86.82% | 34.96 | 24.07 | 698 |
| Dallas | 100.00% | 13.39 | 1.69 | 99.73% | 9.86 | 1.77 | 100.00% | 17.25 | 1.65 | 99.73% | 40.50 | 3.08 | 743 |
| New York | 100.00% | 13.91 | 5.89 | 99.87% | 9.18 | 7.45 | 100.00% | 11.20 | 4.29 | 99.87% | 34.29 | 10.11 | 741 |
| Seattle | 99.72% | 12.21 | 2.51 | 100.00% | 10.13 | 2.40 | 100.00% | 18.54 | 3.91 | 99.45% | 40.88 | 5.66 | 726 |

| Success Rate (180 sec) | Send Time | Send Variability | Success Rate (300 sec) | Notification Time | Notification Variability | Success Rate (180 sec) | Retrieve Time | Retrieve Variability | Overall Success Rate | Overall Average Time | Overall Variability | Samples |
|--|--|--|--|--|--|--|--|--|--|--|--|---------|
| Green ≥ 99.5% Yellow > 99% - < 99.5% Red ≤ 99% | Green ≤ 30 Yellow > 30 - ≤ 45 Red ≥ 45 | Green ≤ 5 Yellow > 5 - ≤ 10 Red ≥ 10 | Green ≥ 99.5% Yellow > 99% - < 99.5% Red ≤ 99% | Green ≤ 20 Yellow > 20 - ≤ 45 Red ≥ 45 | Green ≤ 10 Yellow > 10 - ≤ 15 Red ≥ 15 | Green ≥ 99.5% Yellow > 99% - < 99.5% Red ≤ 99% | Green ≤ 15 Yellow > 15 - ≤ 20 Red ≥ 20 | Green ≤ 5 Yellow > 5 - ≤ 10 Red ≥ 10 | Green ≥ 99% Yellow > 98% - < 99% Red ≤ 98% | Green ≤ 60 Yellow > 60 - ≤ 90 Red ≥ 90 | Green ≤ 30 Yellow > 30 - ≤ 30 Red ≥ 30 | Samples |

| Verizon Market | MMS Notification Delivery | | | Delivery Timings | | | Reliability Issues | | Samples |
|----------------|---------------------------|------------------------|------------------------------|------------------|------------------|-------------------|--------------------|-------------------|---------|
| | Success Rate (300s) (%) | Average Time (seconds) | Standard Deviation (seconds) | < 30 seconds (%) | < 60 seconds (%) | < 120 seconds (%) | ≥ 2 minutes (%) | Lost Messages (%) | |
| Chicago | 98.42% | 11.79 | 14.80 | 95.95% | 97.41% | 97.73% | 2.27% | 0.00% | 698 |
| Dallas | 99.73% | 9.86 | 1.77 | 99.73% | 99.73% | 99.73% | 0.27% | 0.00% | 743 |
| New York | 99.87% | 9.18 | 7.45 | 99.19% | 99.73% | 99.73% | 0.27% | 0.00% | 741 |
| Seattle | 100.00% | 10.13 | 2.40 | 99.59% | 99.72% | 99.72% | 0.28% | 0.00% | 726 |

| Success Rate (300 sec) | Notification Time | Notification Variability | < 30 seconds | < 60 seconds | < 120 seconds | ≥ 2 minutes | Lost Messages | Samples |
|--|--|--|--|--|--|--|--|---------|
| Green ≥ 99.5% Yellow > 99% - < 99.5% Red ≤ 99% | Green ≤ 20 Yellow > 20 - ≤ 45 Red ≥ 45 | Green ≤ 10 Yellow > 10 - ≤ 20 Red ≥ 20 | Green ≥ 96% Yellow > 94% - < 96% Red ≤ 94% | Green ≥ 98% Yellow > 89% - < 98% Red ≤ 89% | Green ≥ 98% Yellow > 89% - < 98% Red ≤ 89% | Green ≤ 2% Yellow > 2% - < 3% Red ≥ 3% | Green ≤ 0.75% Yellow > 0.75% - < 1.50% Red ≥ 1.50% | Samples |

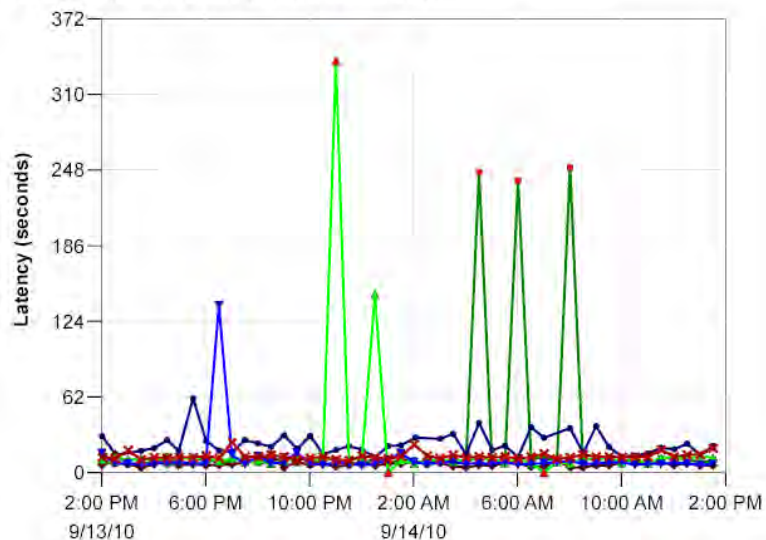
FTP Download 1 Mb Trends

| | | Mar | Apr | May | Jun | Jul | Aug |
|-------------------------|---|---------|---------|---------|---------|---------|---------|
| FTP Download 1 Mb | Success Rate (%) | 98.95% | 96.56% | 96.32% | 98.55% | 99.99% | 99.99% |
| | Harmonic Average Throughput (seconds) | 582.37 | 1050.91 | 1244.03 | 1249.53 | 1213.93 | 1364.95 |
| | Standard Dev (kbps) | 638.29 | 652.66 | 645.30 | 607.22 | 555.17 | 530.87 |
| | Max Throughput (kbps) | 5158.46 | 4972.01 | 6178.72 | 4472.15 | 4383.00 | 4359.13 |
| | Min Throughput (kbps) | 30.78 | 31.55 | 40.87 | 32.08 | 35.34 | 36.67 |

- Overall success rate was the best observed in six months
- Average throughput was higher in August, mostly due to Chicago

SMS Performance

Messaging Performance
24 Hours (9/13/10 2:00 PM - 9/14/10 2:00 PM)



| Test | Performance | Availability | Measurements | Errors | Trimmed |
|--|-------------|--------------|--------------|--------|---------|
| ■ SMS - AT&T to AT&T AT&T - Nokia Surge - Dallas, TX | 9.21 sec | 93.8% | 48 | 3 | 0 |
| ● SMS - Boost to Boost Boost - Motorola i776 - Dallas, TX | 23.27 sec | 100% | 45 | 0 | 0 |
| ◆ SMS - MetroPCS to MetroPCS MetroPCS - Samsung R350 - Dallas, TX | 7.09 sec | 100% | 48 | 0 | 0 |
| ▲ SMS - Sprint to Sprint Sprint CDMA - Samsung Rant - Dallas, TX | 13.51 sec | 93.8% | 48 | 3 | 0 |
| ▼ SMS - T-Mobile to T-Mobile T-Mobile - Samsung T559 - Dallas, TX | 11.13 sec | 100% | 48 | 0 | 0 |
| × SMS - Verizon to Verizon Verizon - Samsung A670 - Dallas, TX | 13.52 sec | 100% | 48 | 0 | 0 |

Key Question

✓ ***ANSWERED!***

1. How am I doing?

The answers to that question allow you to troubleshoot, adjust system design, plan for future capital investments – COMPETE!

Understand Your Competition

Key Question #2

What about my competitors?

Competitive Benchmarking – helps you understand what you’re up against.

- From multiple markets
- From multiple networks
- Using real handsets
- For multiple services:
 - SMS
 - MMS
 - WAP
 - Streaming
 - Throughput

| Overall Success Rate | | Destination | | | | Overall Average Time | | Destination | | | |
|----------------------------------|--|--|--|--|--------------|--|--|--|--|------------|------------|
| | | Operator A | Operator B | Operator C | Operator D | | | Operator A | Operator B | Operator C | Operator D |
| Origination | Operator A | 99.49% | 94.46% | 99.62% | 99.39% | Origination | Operator A | 9.04 | 11.97 | 12.64 | 13.85 |
| | Operator B | 95.17% | 94.44% | 94.90% | 95.29% | | Operator B | 9.14 | 10.74 | 10.20 | 14.81 |
| | Operator C | 99.35% | 95.25% | 99.90% | 99.28% | | Operator C | 11.52 | 12.08 | 10.63 | 16.44 |
| | Operator D | 99.90% | 94.11% | 99.69% | 99.90% | | Operator D | 12.23 | 14.43 | 12.87 | 16.31 |
| Intra-Market, 180 second timeout | Overall Success Rate | Overall Success Rate | Overall Success Rate | Overall Success Rate | Intra-Market | Overall Average Time | Overall Average Time | Overall Average Time | Overall Average Time | | |
| | Green ≥ 99.5% Yellow > 99% - < 99.5% Red ≤ 99% | Green ≥ 99.5% Yellow > 99% - < 99.5% Red ≤ 99% | Green ≥ 99.5% Yellow > 99% - < 99.5% Red ≤ 99% | Green ≥ 99.5% Yellow > 99% - < 99.5% Red ≤ 99% | | Green ≤ 10 Yellow > 10 - ≤ 20 Red ≥ 20 | Green ≤ 10 Yellow > 10 - ≤ 20 Red ≥ 20 | Green ≤ 10 Yellow > 10 - ≤ 20 Red ≥ 20 | Green ≤ 10 Yellow > 10 - ≤ 20 Red ≥ 20 | | |

SMS

| Overall Success Rate | | Destination | | | | Overall Average Time | | Destination | | | |
|----------------------------------|--|--|--|--|--------------|--|--|--|--|------------|------------|
| | | Operator A | Operator B | Operator C | Operator D | | | Operator A | Operator B | Operator C | Operator D |
| Origination | Operator A | 99.09% | 94.75% | 96.45% | 94.00% | Origination | Operator A | 25.80 | 50.62 | 55.06 | 56.73 |
| | Operator B | 97.14% | 95.95% | 96.24% | 96.78% | | Operator B | 36.04 | 45.19 | 56.03 | 49.30 |
| | Operator C | 96.39% | 93.55% | 97.35% | 95.59% | | Operator C | 37.74 | 54.62 | 48.76 | 53.26 |
| | Operator D | 96.91% | 94.48% | 92.57% | 98.79% | | Operator D | 40.27 | 49.85 | 65.01 | 39.16 |
| Intra-Market, 300 second timeout | Overall Success Rate | Overall Success Rate | Overall Success Rate | Overall Success Rate | Intra-Market | Overall Average Time | Overall Average Time | Overall Average Time | Overall Average Time | | |
| | Green ≥ 98% Yellow > 98% - < 99% Red ≤ 98% | Green ≥ 98% Yellow > 98% - < 99% Red ≤ 98% | Green ≥ 98% Yellow > 98% - < 99% Red ≤ 98% | Green ≥ 98% Yellow > 98% - < 99% Red ≤ 98% | | Green ≤ 60 Yellow > 60 - ≤ 90 Red ≥ 90 | Green ≤ 60 Yellow > 60 - ≤ 90 Red ≥ 90 | Green ≤ 60 Yellow > 60 - ≤ 90 Red ≥ 90 | Green ≤ 60 Yellow > 60 - ≤ 90 Red ≥ 90 | | |

MMS

SMS National Scorecard

| Operator Network | Overall | | | Samples |
|------------------|--------------------|------------------------|------------------------------|---------|
| | 180 second timeout | | | |
| | Success Rate (%) | Average Time (seconds) | Standard Deviation (seconds) | |
| AT&T | 99.90% | 10.41 | 8.03 | 3117 |
| Sprint | 99.54% | 9.81 | 2.80 | 3048 |
| T-Mobile | 100.00% | 8.72 | 7.96 | 3108 |
| Verizon | 99.61% | 15.66 | 10.56 | 3105 |

| | | | |
|---|--|---|---------|
| Overall Success Rate Green $\geq 99.5\%$ Yellow $> 99\% - < 99.5\%$ Red $\leq 99\%$ | Overall Average Time Green ≤ 10 Yellow $> 10 - \leq 20$ Red ≥ 20 | Overall Variability Green ≤ 10 Yellow $> 10 - \leq 15$ Red ≥ 15 | Samples |
|---|--|---|---------|

- AT&T had the second-best overall success rate this month
- Sprint had the worst success rate this month
- T-Mobile had the fastest average time this month
- Verizon had the worst overall average time

Inter-Carrier MMS Overall Success Rate

| Overall Success Rate | | Destination | | | |
|----------------------------------|----------|--|--|--|--|
| | | AT&T | Sprint | T-Mobile | Verizon |
| Origination | AT&T | 99.11% | 92.12% | 96.79% | 98.85% |
| | Sprint | 97.04% | 95.07% | 95.21% | 97.75% |
| | T-Mobile | 95.69% | 91.02% | 97.17% | 95.89% |
| | Verizon | 97.45% | 93.93% | 96.65% | 99.19% |
| Intra-Market, 300 second timeout | | Overall Success Rate Green ≥ 99% Yellow > 98% - < 99% Red ≤ 98% | Overall Success Rate Green ≥ 99% Yellow > 98% - < 99% Red ≤ 98% | Overall Success Rate Green ≥ 99% Yellow > 98% - < 99% Red ≤ 98% | Overall Success Rate Green ≥ 99% Yellow > 98% - < 99% Red ≤ 98% |

June, 2010

| Overall Success Rate | | Destination | | | |
|----------------------------------|----------|--|--|--|--|
| | | AT&T | Sprint | T-Mobile | Verizon |
| Origination | AT&T | 99.64% | 89.35% | 95.54% | 98.05% |
| | Sprint | 97.15% | 92.21% | 95.28% | 97.24% |
| | T-Mobile | 96.56% | 91.38% | 97.15% | 97.59% |
| | Verizon | 97.19% | 91.90% | 96.50% | 98.61% |
| Intra-Market, 300 second timeout | | Overall Success Rate Green ≥ 99% Yellow > 98% - < 99% Red ≤ 98% | Overall Success Rate Green ≥ 99% Yellow > 98% - < 99% Red ≤ 98% | Overall Success Rate Green ≥ 99% Yellow > 98% - < 99% Red ≤ 98% | Overall Success Rate Green ≥ 99% Yellow > 98% - < 99% Red ≤ 98% |

July, 2010

| Overall Success Rate | | Destination | | | |
|----------------------------------|----------|--|--|--|--|
| | | AT&T | Sprint | T-Mobile | Verizon |
| Origination | AT&T | 98.62% | 87.39% | 95.09% | 98.62% |
| | Sprint | 97.51% | 88.67% | 95.74% | 98.19% |
| | T-Mobile | 97.96% | 89.03% | 97.67% | 98.63% |
| | Verizon | 96.45% | 87.48% | 95.01% | 96.60% |
| Intra-Market, 300 second timeout | | Overall Success Rate Green ≥ 99% Yellow > 98% - < 99% Red ≤ 98% | Overall Success Rate Green ≥ 99% Yellow > 98% - < 99% Red ≤ 98% | Overall Success Rate Green ≥ 99% Yellow > 98% - < 99% Red ≤ 98% | Overall Success Rate Green ≥ 99% Yellow > 98% - < 99% Red ≤ 98% |

August, 2010

- Success rate for MMS messages to AT&T handsets from other carriers were basically unchanged in August
- Success rate was low to all carriers when the sending device was on Sprint or T-Mobile

Competitive Benchmarking - Market View

| Market | DNS Resolve | | | TCP Connect | | Time to 1st Byte | |
|-------------|------------------|------------------------------|---------------------------|------------------------------|---------------------------|------------------------------|---------------------------|
| | Success Rate (%) | Arithmetic Average Time (ms) | Standard Deviation (secs) | Arithmetic Average Time (ms) | Standard Deviation (secs) | Arithmetic Average Time (ms) | Standard Deviation (secs) |
| Atlanta | 100.00% | 167 | 0.29 | 451 | 0.60 | 1007 | 1.17 |
| Chicago | 100.00% | 160 | 0.16 | 132 | 0.14 | 194 | 0.06 |
| Dallas | 99.86% | 222 | 0.39 | 168 | 0.19 | 278 | 0.22 |
| Los Angeles | 99.73% | 130 | 0.05 | 159 | 0.03 | 189 | 0.02 |
| New York | 100.00% | 229 | 0.20 | 185 | 0.15 | 264 | 0.18 |
| San Diego | 99.80% | 220 | 0.07 | 145 | 0.02 | 271 | 0.08 |
| Seattle | 99.73% | 144 | 0.11 | 95 | 0.04 | 196 | 0.11 |

| | | |
|---|---|---|
| Success Rate Green $\geq 99\%$ Yellow $> 95\% - < 99\%$ Red $\leq 95\%$ | Arithmetic Average Time Green ≤ 250 Yellow $> 250 - \leq 500$ Red ≥ 500 | Variability Green ≤ 1.0 Yellow $> 1.0 - \leq 2.0$ Red ≥ 2.0 |
|---|---|---|

| | |
|---|---|
| Arithmetic Average Time Green ≤ 250 Yellow $> 250 - \leq 500$ Red ≥ 500 | Variability Green ≤ 0.25 Yellow $> 0.25 - \leq 0.5$ Red ≥ 0.5 |
|---|---|

| | |
|---|---|
| Arithmetic Average Time Green ≤ 250 Yellow $> 250 - \leq 500$ Red ≥ 500 | Variability Green ≤ 0.25 Yellow $> 0.25 - \leq 0.5$ Red ≥ 0.5 |
|---|---|

Competitive Benchmarking of Core Data Services

| HTTP GET - 4MB | | | | | | |
|----------------|------------------|------------------------|----------------------------------|---------------------------|--------------------|---------------------------|
| Operator | Success Rate (%) | TCP Connect Time (sec) | User Perceived Throughput (kbps) | Average Throughput (kbps) | Average Time (sec) | Standard Deviation (kbps) |
| Operator A | 100.00% | 0.15 | 1153.72 | 1159.78 | 3.58 | 154.34 |
| Operator B | 99.51% | 0.15 | 1099.08 | 1105.80 | 4.33 | 372.74 |
| Operator C | 99.70% | 0.15 | 1116.80 | 1123.75 | 4.79 | 314.01 |
| Operator D | 98.80% | 0.29 | 1023.44 | 1035.11 | 7.73 | 586.32 |

| | | | | | |
|---|--|---|--|---|--|
| HTTP Download Success Rate Green $\geq 98\%$ Yellow $> 96\% - < 98\%$ Red $\leq 96\%$ | Average TCP Connect Time Green ≤ 0.25 Yellow $> 0.25 - \leq 0.5$ Red ≥ 0.5 | User Perceived Average Throughput Green ≥ 500 Yellow $< 500 - \geq 350$ Red ≤ 350 | Average Throughput Green ≥ 500 Yellow $< 500 - \geq 350$ Red ≤ 350 | Average Time Green ≤ 8 Yellow $> 8 - \leq 11$ Red > 11 | Throughput Variability Green ≤ 300 Yellow $> 300 - \leq 600$ Red ≥ 600 |
|---|--|---|--|---|--|

Data Session Setup Trends by Market

| Operator Network | | Data Session Success Rate (%) | | | Arithmetic Average (seconds) | | | Standard Dev (seconds) | | |
|------------------|--------------------|-------------------------------|--------|--------|------------------------------|------|------|------------------------|------|------|
| Operator | Network Technology | Jun | Jul | Aug | Jun | Jul | Aug | Jun | Jul | Aug |
| AT&T | HSPA | 99.01% | 98.97% | 98.88% | 3.00 | 2.92 | 2.97 | 1.11 | 0.84 | 0.79 |
| Sprint | EVDO | 97.57% | 94.74% | 93.52% | 1.86 | 1.89 | 2.02 | 0.98 | 1.18 | 1.36 |
| T-Mobile | HSPA | 98.10% | 98.29% | 96.38% | 3.49 | 3.41 | 3.46 | 1.82 | 1.62 | 1.71 |
| Verizon | EVDO | 99.57% | 99.26% | 98.68% | 2.68 | 2.74 | 2.72 | 2.10 | 2.27 | 2.08 |

| Data Session Success Rate | Data Session Success Rate | Data Session Success Rate | Arithmetic Average | Arithmetic Average | Arithmetic Average | Data Session Variability | Data Session Variability | Data Session Variability |
|----------------------------|----------------------------|----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Green $\geq 99\%$ | Green $\geq 99\%$ | Green $\geq 99\%$ | Green ≤ 4.5 | Green ≤ 4.5 | Green ≤ 4.5 | Green ≤ 1.0 | Green ≤ 1.0 | Green ≤ 1.0 |
| Yellow $> 95\%$ - $< 99\%$ | Yellow $> 95\%$ - $< 99\%$ | Yellow $> 95\%$ - $< 99\%$ | Yellow > 4.5 - ≤ 6.0 | Yellow > 4.5 - ≤ 6.0 | Yellow > 4.5 - ≤ 6.0 | Yellow > 1.0 - ≤ 2.0 | Yellow > 1.0 - ≤ 2.0 | Yellow > 1.0 - ≤ 2.0 |
| Red $\leq 95\%$ | Red $\leq 95\%$ | Red $\leq 95\%$ | Red ≥ 6.0 | Red ≥ 6.0 | Red ≥ 6.0 | Red ≥ 2.0 | Red ≥ 2.0 | Red ≥ 2.0 |

| AT&T | | Data Session Success Rate (%) | | | Arithmetic Average (seconds) | | | Standard Dev (seconds) | | |
|-------------|--------------------|-------------------------------|--------|--------|------------------------------|------|------|------------------------|------|------|
| Market | Network Technology | Jun | Jul | Aug | Jun | Jul | Aug | Jun | Jul | Aug |
| Chicago | Ericsson | 98.56% | 99.28% | 99.68% | 3.07 | 3.06 | 3.04 | 1.46 | 1.82 | 0.67 |
| Dallas | Ericsson | 99.75% | 99.76% | 97.85% | 2.88 | 2.85 | 2.86 | 0.75 | 0.24 | 0.25 |
| Los Angeles | Ericsson | 99.72% | 99.76% | 99.45% | 3.02 | 2.92 | 3.00 | 1.07 | 0.86 | 0.90 |
| New York | Lucent | 96.00% | 95.96% | 98.56% | 3.01 | 2.81 | 3.05 | 1.85 | 0.29 | 1.51 |
| Orlando | Ericsson | 99.92% | 99.97% | 99.51% | 2.78 | 2.75 | 2.78 | 0.23 | 0.20 | 0.67 |
| San Diego | Ericsson | 99.86% | 99.97% | 99.76% | 3.05 | 3.02 | 3.00 | 0.25 | 0.21 | 0.25 |
| Seattle | Lucent | 98.93% | 97.55% | 97.07% | 3.28 | 3.09 | 3.06 | 1.18 | 0.78 | 0.62 |

- Dallas, New York, and Seattle are still shy of 99% success rate
- Average time was slower in New York

FTP Upload 1 Mb National Scorecard

| Operator Network | | FTP Upload 1 Mb | | | Range | | Samples |
|------------------|--------------------|------------------|------------------------------------|---------------------------|-----------------------|-----------------------|---------|
| Operator | Network Technology | Success Rate (%) | Harmonic Average Throughput (kbps) | Standard Deviation (kbps) | Max Throughput (kbps) | Min Throughput (kbps) | |
| AT&T | HSPA | 99.94% | 423.44 | 326.05 | 1519.90 | 28.63 | 19169 |
| Sprint | EVDO | 99.69% | 197.97 | 159.53 | 791.61 | 28.95 | 17165 |
| T-Mobile | HSPA | 99.29% | 343.48 | 238.70 | 1196.82 | 33.34 | 4503 |
| Verizon | EVDO | 99.89% | 382.18 | 200.59 | 1049.71 | 36.25 | 18835 |

| FTP Upload Success Rate | Harmonic Average Throughput | Throughput Variability | Maximum Throughput | Minimum Throughput | Samples |
|--|---|---|---|---|---------|
| Green $\geq 99\%$ Yellow $> 95\% - < 99\%$ Red $\leq 95\%$ | Green ≥ 1000 Yellow $< 1000 - \geq 600$ Red ≤ 600 | Green ≤ 300 Yellow $> 300 - \leq 600$ Red ≥ 600 | Green ≥ 1000 Yellow $< 1000 - \geq 600$ Red ≤ 600 | Green ≥ 1000 Yellow $< 1000 - \geq 600$ Red ≤ 600 | |

Key Question

✓ **ANSWERED!**

2. What about my competitors?

In addition to gaining valuable competitive data, answering this question can give you insights into how your competitors are deploying resources, what services they're planning, and their areas of vulnerability.

Today's Agenda

1. Introductions & Keynote Overview
2. Leveling the Playing Field
3. Partner & SLA Management
4. Improving Troubleshooting Effectiveness
5. Q & A/Wrap-up

Keys to SLA Management

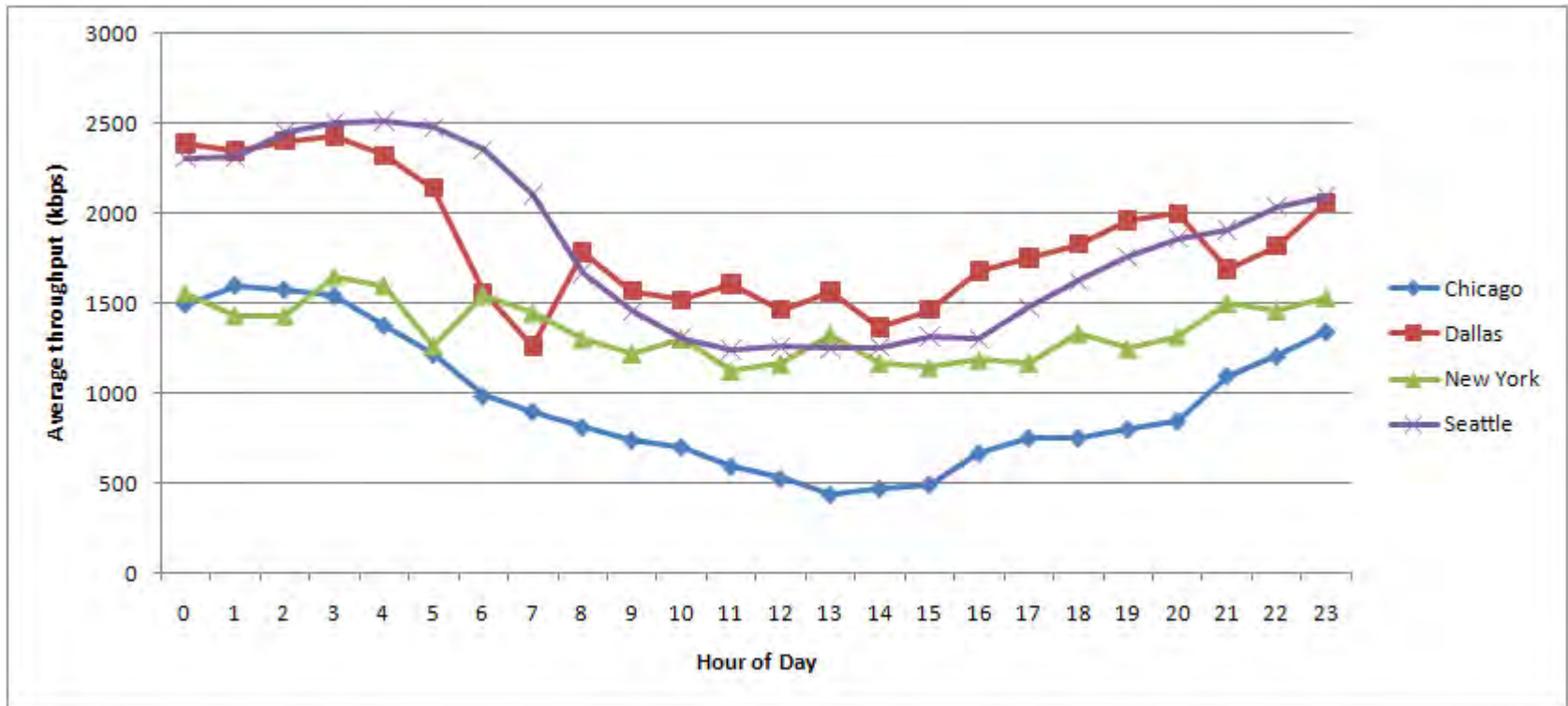
- Data Requirements - Objective vs. Anecdotal
- Metrics – Mutual Agreement
- Performance Problems
 - Notification
 - Grace/Correction Period
 - Penalties Imposed

SLA Management Support

| CHALLENGE | SOLUTION |
|--|--|
| ➤ Data Requirements – Objective vs. Anecdotal | ✓ Remove the emotion – utilize a “Disinterested 3 rd Party” |
| ➤ Metrics – Mutual Agreement | ✓ Transparency – Access to the same data |
| ➤ Performance Problems ➤ Notification ➤ Grace/Correction Period ➤ Penalties Imposed | ✓ Tracking, trending & comparison through multiple time periods |

Understanding the expected pattern over time

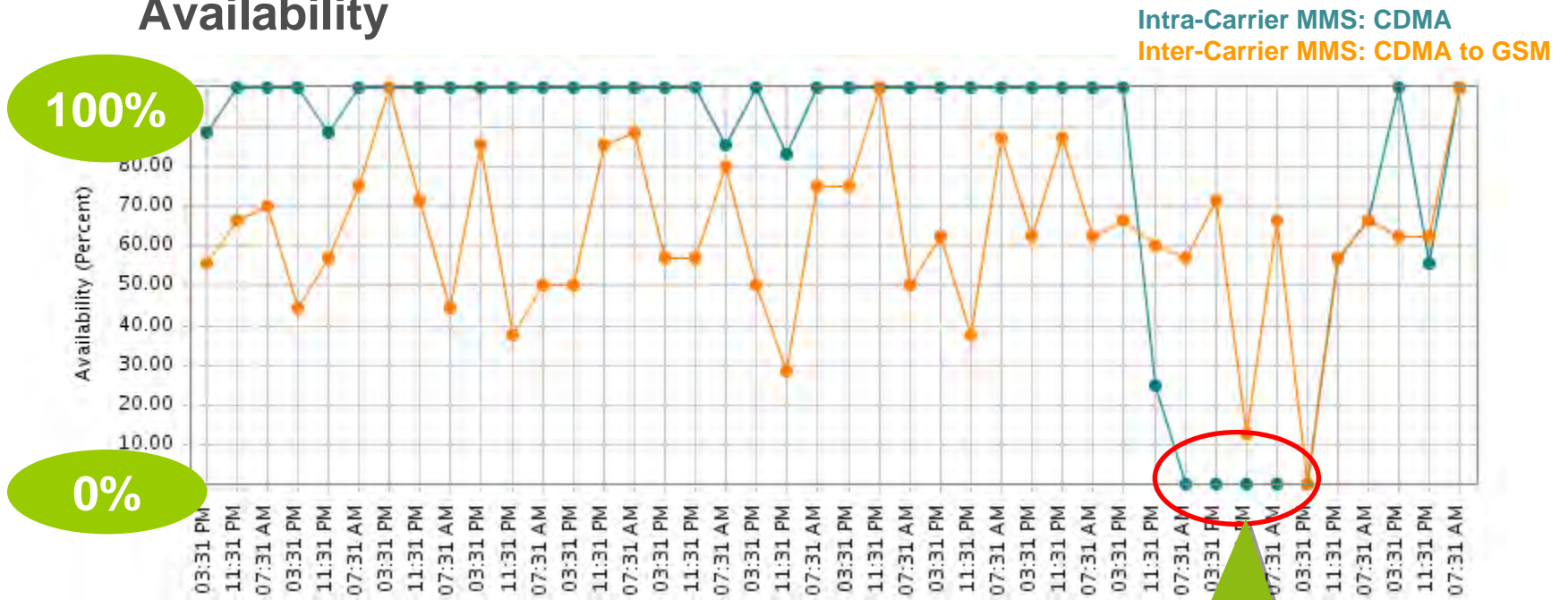
Performance



Performance Throughput Variations:
Repeatable active measurements creates true delivery patterns

Understanding the expected pattern over time

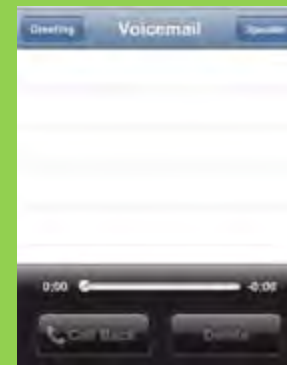
Availability



Service Availability

This messaging service has reliability issues. It also had a complete outage that lasted for several hours.

Determining when outages occur



Actual LCD Screen

Test Case: Voice Mail
Time for VVM indicator

Partner & SLA Management

Operator/Aggregator Use Case

- *Agreed on delivery metrics*
- *Established common monitoring capabilities*
- *Identified outages/performance issues*
- *Agreed on corrective action*
- *Monitoring ongoing compliance*

AT&T Availability

keynote™ Mobile Device Perspective™

Status Reports Diagnostics Alerts Settings Help Log Out

Display Messaging summary data for last 24 hours grouped by carrier

Messaging Test Results

| | 9/13 | | | 9/14 | | | |
|--------------------------------------|---------------------|--------------------|--------------------|---------------------|--------------------|--------------------|---------------------|
| | 10:00 AM to 1:59 PM | 2:00 PM to 5:59 PM | 6:00 PM to 9:59 PM | 10:00 PM to 1:59 AM | 2:00 AM to 5:59 AM | 6:00 AM to 9:59 AM | 10:00 AM to 1:39 PM |
| AT&T | 100% | 100% | 97.9% | 100% | 97.9% | 91.7% | 100% |
| SMS - AT&T to T-Mobile Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| SMS - AT&T to Verizon Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| SMS - AT&T to AT&T Dallas, TX | 100% | 100% | 100% | 100% | 87.5% | 75% | 100% |
| SMS - AT&T to Sprint Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| SMS - ATT to Boost Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| SMS - ATT to MetroPCS Dallas, TX | 100% | 100% | 87.5% | 100% | 100% | 75% | 100% |
| Boost | 100% | 100% | 97.6% | 95% | 94.9% | 95.7% | 100% |
| MetroPCS | 100% | 91.7% | 95.8% | 97.9% | 100% | 75% | 100% |
| Sprint CDMA | 100% | 97.9% | 100% | 89.6% | 87.5% | 91.7% | 100% |
| T-Mobile | 97.9% | 100% | 100% | 100% | 100% | 95.8% | 100% |
| Verizon | 100% | 97.9% | 100% | 100% | 100% | 93.8% | 100% |

About the Current Status

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- Orange indicates an error status with 70%-80% success.
- Red indicates a critical error status with less than 70% success.
- Gray indicates that the current status is unknown, there is no data, or waiting for first measurement.

Data view last refreshed Tue Sep 14 13:39:54 PDT 2010

Boost Availability

keynote™ Mobile Device Perspective™

Status Reports Diagnostics Alerts Settings Help Log Out

Display Messaging summary data for last 24 hours grouped by carrier

Messaging Test Results

| 9/13 1:00 PM to 9/14 1:41 PM | 9/13 | | | 9/14 | | | |
|---------------------------------------|---------------------|--------------------|--------------------|---------------------|--------------------|--------------------|---------------------|
| | 10:00 AM to 1:59 PM | 2:00 PM to 5:59 PM | 6:00 PM to 9:59 PM | 10:00 PM to 1:59 AM | 2:00 AM to 5:59 AM | 6:00 AM to 9:59 AM | 10:00 AM to 1:41 PM |
| AT&T | 100% | 100% | 97.9% | 100% | 97.9% | 91.7% | 100% |
| Boost | 100% | 100% | 97.6% | 95% | 94.9% | 95.7% | 100% |
| SMS - Boost to AT&T Dallas, TX | 100% | 100% | 100% | 87.5% | 100% | 100% | 100% |
| SMS - Boost to Boost Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| SMS - Boost to MetroPCS Dallas, TX | 100% | 100% | 87.5% | 100% | 100% | 75% | 100% |
| SMS - Boost to Sprint Dallas, TX | 100% | 100% | 100% | 85.7% | 100% | 100% | 100% |
| SMS - Boost to T-Mobile Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| SMS - Boost to Verizon Dallas, TX | 100% | 100% | 100% | 100% | 60% | 100% | 100% |
| MetroPCS | 100% | 91.7% | 95.8% | 97.9% | 100% | 75% | 100% |
| Sprint CDMA | 100% | 97.9% | 100% | 89.6% | 87.5% | 91.7% | 100% |
| T-Mobile | 97.9% | 100% | 100% | 100% | 100% | 95.8% | 100% |
| Verizon | 100% | 97.9% | 100% | 100% | 100% | 93.8% | 100% |

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Data view last refreshed Tue Sep 14 13:41:16 PDT 2010

MetroPCS Availability

keynote™ Mobile Device Perspective™
Log Out

Status Reports Diagnostics Alerts Settings Help

Display Messaging summary data for last 24 hours grouped by carrier

Messaging Test Results

| | 9/13 | | | 9/14 | | | |
|---------------------------------------|---------------------|--------------------|--------------------|---------------------|--------------------|--------------------|---------------------|
| | 10:00 AM to 1:59 PM | 2:00 PM to 5:59 PM | 6:00 PM to 9:59 PM | 10:00 PM to 1:59 AM | 2:00 AM to 5:59 AM | 6:00 AM to 9:59 AM | 10:00 AM to 1:41 PM |
| 9/13 1:00 PM to 9/14 1:41 PM | | | | | | | |
| AT&T | 100% | 100% | 97.9% | 100% | 97.9% | 91.7% | 100% |
| Boost | 100% | 100% | 97.6% | 95% | 94.9% | 95.7% | 100% |
| MetroPCS | 100% | 91.7% | 95.8% | 97.9% | 100% | 75% | 100% |
| SMS - MetroPCS to AT&T Dallas, TX | 100% | 75% | 100% | 100% | 100% | 75% | 100% |
| SMS - MetroPCS to Boost Dallas, TX | 100% | 100% | 100% | 100% | 100% | 62.5% | 100% |
| SMS - MetroPCS to MetroPCS Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| SMS - MetroPCS to Sprint Dallas, TX | 100% | 100% | 75% | 87.5% | 100% | 62.5% | 100% |
| SMS - MetroPCS to T-Mobile Dallas, TX | 100% | 87.5% | 100% | 100% | 100% | 75% | 100% |
| SMS - MetroPCS to Verizon Dallas, TX | 100% | 87.5% | 100% | 100% | 100% | 75% | 100% |
| Sprint CDMA | 100% | 97.9% | 100% | 89.6% | 87.5% | 91.7% | 100% |
| T-Mobile | 97.9% | 100% | 100% | 100% | 100% | 95.8% | 100% |
| Verizon | 100% | 97.9% | 100% | 100% | 100% | 93.8% | 100% |

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Data view last refreshed Tue Sep 14 13:41:16 PDT 2010

Sprint Availability

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Status Reports Diagnostics Alerts Settings Help Log Out

Display Messaging summary data for last 24 hours grouped by carrier

Messaging Test Results

| 9/13 1:00 PM to 9/14 1:41 PM | 9/13 | | | 9/14 | | | |
|--|---------------------|--------------------|--------------------|---------------------|--------------------|--------------------|---------------------|
| | 10:00 AM to 1:59 PM | 2:00 PM to 5:59 PM | 6:00 PM to 9:59 PM | 10:00 PM to 1:59 AM | 2:00 AM to 5:59 AM | 6:00 AM to 9:59 AM | 10:00 AM to 1:41 PM |
| AT&T | 100% | 100% | 97.9% | 100% | 97.9% | 91.7% | 100% |
| Boost | 100% | 100% | 97.6% | 95% | 94.9% | 95.7% | 100% |
| MetroPCS | 100% | 91.7% | 95.8% | 97.9% | 100% | 75% | 100% |
| Sprint CDMA | 100% | 97.9% | 100% | 89.6% | 87.5% | 91.7% | 100% |
| SMS - Sprint to T-Mobile Dallas, TX | 100% | 100% | 100% | 87.5% | 100% | 100% | 100% |
| SMS - Sprint to Verizon Dallas, TX | 100% | 100% | 100% | 100% | 75% | 100% | 100% |
| SMS - Sprint to AT&T Dallas, TX | 100% | 87.5% | 100% | 87.5% | 87.5% | 87.5% | 100% |
| SMS - Sprint to Boost Dallas, TX | 100% | 100% | 100% | 87.5% | 75% | 100% | 100% |
| SMS - Sprint to MetroPCS Dallas, TX | 100% | 100% | 100% | 100% | 87.5% | 75% | 100% |
| SMS - Sprint to Sprint Dallas, TX | 100% | 100% | 100% | 75% | 100% | 87.5% | 100% |
| T-Mobile | 97.9% | 100% | 100% | 100% | 100% | 95.8% | 100% |
| Verizon | 100% | 97.9% | 100% | 100% | 100% | 93.8% | 100% |

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Data view last refreshed Tue Sep 14 13:41:16 PDT 2010

T-Mobile Availability

keynote™ Mobile Device Perspective™

Status Reports Diagnostics Alerts Settings Help Log Out

Display Messaging summary data for last 24 hours grouped by carrier

Messaging Test Results

| 9/13 1:00 PM to 9/14 1:43 PM | 9/13 | | | 9/14 | | | |
|--|---------------------|--------------------|--------------------|---------------------|--------------------|--------------------|---------------------|
| | 10:00 AM to 1:59 PM | 2:00 PM to 5:59 PM | 6:00 PM to 9:59 PM | 10:00 PM to 1:59 AM | 2:00 AM to 5:59 AM | 6:00 AM to 9:59 AM | 10:00 AM to 1:43 PM |
| AT&T | 100% | 100% | 97.9% | 100% | 97.9% | 91.7% | 100% |
| Boost | 100% | 100% | 97.6% | 95% | 94.9% | 95.7% | 100% |
| MetroPCS | 100% | 91.7% | 95.8% | 97.9% | 100% | 75% | 100% |
| Sprint CDMA | 100% | 97.9% | 100% | 89.6% | 87.5% | 91.7% | 100% |
| T-Mobile | 97.9% | 100% | 100% | 100% | 100% | 95.8% | 100% |
| SMS - T-Mobile to AT&T Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| SMS - T-Mobile to Boost Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| SMS - T-Mobile to MetroPCS Dallas, TX | 100% | 100% | 100% | 100% | 100% | 75% | 100% |
| SMS - T-Mobile to Sprint Dallas, TX | 87.5% | 100% | 100% | 100% | 100% | 100% | 100% |
| SMS - T-Mobile to T-Mobile Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| SMS - T-Mobile to Verizon Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Verizon | 100% | 97.9% | 100% | 100% | 100% | 93.8% | 100% |

About the Current Status

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Data view last refreshed Tue Sep 14 13:43:16 PDT 2010

Verizon Availability

keynote™ Mobile Device Perspective™

Status Reports Diagnostics Alerts Settings Help Log Out

Display Messaging summary data for last 24 hours grouped by carrier

Messaging Test Results

| 9/13 1:00 PM to 9/14 1:43 PM | 9/13 | | | 9/14 | | | |
|---|---------------------|--------------------|--------------------|---------------------|--------------------|--------------------|---------------------|
| | 10:00 AM to 1:59 PM | 2:00 PM to 5:59 PM | 6:00 PM to 9:59 PM | 10:00 PM to 1:59 AM | 2:00 AM to 5:59 AM | 6:00 AM to 9:59 AM | 10:00 AM to 1:43 PM |
| AT&T | 100% | 100% | 97.9% | 100% | 97.9% | 91.7% | 100% |
| Boost | 100% | 100% | 97.6% | 95% | 94.9% | 95.7% | 100% |
| MetroPCS | 100% | 91.7% | 95.8% | 97.9% | 100% | 75% | 100% |
| Sprint CDMA | 100% | 97.9% | 100% | 89.6% | 87.5% | 91.7% | 100% |
| T-Mobile | 97.9% | 100% | 100% | 100% | 100% | 95.8% | 100% |
| Verizon | 100% | 97.9% | 100% | 100% | 100% | 93.8% | 100% |
| SMS - Verizon to T-Mobile Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| SMS - Verizon to AT&T Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| SMS - Verizon to Boost Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| SMS - Verizon to MetroPCS Dallas, TX | 100% | 87.5% | 100% | 100% | 100% | 62.5% | 100% |
| SMS - Verizon to Sprint Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| SMS - Verizon to Verizon Dallas, TX | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

About the Current Status

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Data view last refreshed Tue Sep 14 13:43:16 PDT 2010

Aggregate Signal Level for Tests

The screenshot displays the Keynote Mobile Device Perspective interface. The main content area is titled 'SMS - AT&T to T-Mobile Messaging Performance' for a 48-hour period from 9/12/10 2:20 PM to 9/14/10 2:20 PM. It features a line graph showing latency in seconds, a 'Test Summary' table, a 'Transaction Performance' table, and a 'Top Errors for Last 48 Hours' table. A blue arrow points from the 'Signal Level' field in the Test Summary table to the text 'Aggregate signal level for multiple tests' on the left.

Test Summary

| | |
|------------------|------------------------|
| T-Mobile | |
| Status | Good |
| Test Name | SMS - AT&T to T-Mobile |
| Average Response | 7.96 seconds |
| Availability | 100% |

Test Details

| | |
|--------------------|-----------------|
| Last Measurement | 9/14/10 2:11 PM |
| Next Measurement | 9/14/10 2:40 PM |
| Location | Dallas, TX |
| Device | Samsung T559 |
| Min Response | 6.09 seconds |
| Max Response | 12.77 seconds |
| Standard Deviation | 1.01 seconds |
| Measurements | 96 |
| Errors | 0 |
| Duplicates | 0 |
| Received | 100% |
| Signal Level | 7 out of 7 |

Transaction Performance

| Description | Avg. Performance | Errors |
|---------------------|---------------------|----------|
| Time to Send SMS | 5.01 seconds | 0 |
| Time to Receive SMS | 2.94 seconds | 0 |
| Total | 7.96 seconds | 0 |

Top Errors for Last 48 Hours

| Error | Count |
|----------------------------|-------|
| No errors for this period. | |

Test Description
SMS Send Timeout: :60 seconds, SMS Receive Timeout: 120 seconds

About Line Graphs

- Red dots indicate that an error occurred. Errors are caused by a test either exceeding its maximum latency, or the destination device completed the test with a resulting error.
- Green dots represent data from successfully completed tests. The graph should consist mostly of Green dots.

Aggregate signal level for multiple tests

Individual Measurement Signal Levels

| Extended Messaging Test Information | |
|--|-------------------------|
| Name: SMS - AT&T to AT&T | |
| Start Time: 9/13/10 2:31:09 PM | |
| Finish Time: 9/13/10 2:31:16 PM | |
| Origination | Destination |
| Node: DAL.SMS.KWC.ATT.SURGE.3 | DAL.SMS.KWC.ATT.SURGE.4 |
| Location: Dallas, TX | Dallas, TX |
| Performance: 7.14 seconds | 7.14 seconds |
| Time to Send SMS 5.06 | 5.06 |
| Time to Receive SMS 2.09 | 2.09 |
| Max Latency: 180 seconds | |
| Network: AT&T | AT&T |
| Device: Nokia Surge | Nokia Surge |
| Phone Number: 2069920364 | 2069926814 |
| Signal Strength: 7 of 7 | |
| Test ID: 656914 | |

| Extended Messaging Test Information | |
|--|-----------------------|
| Name: SMS - Sprint to Sprint | |
| Start Time: 9/14/10 4:30:48 AM | |
| Finish Time: 9/14/10 4:30:59 AM | |
| Origination | Destination |
| Node: DAL.MMS.KWC.SPR.Rat.3 | DAL.MMS.KWC.SPR.Rat.4 |
| Location: Dallas, TX | Dallas, TX |
| Performance: 11.55 seconds | 11.55 seconds |
| Time to Send SMS 3.11 | 3.11 |
| Time to Receive SMS 8.44 | 8.44 |
| Max Latency: 180 seconds | |
| Network: Sprint CDMA | Sprint CDMA |
| Device: Samsung Rant | Samsung Rant |
| Phone Number: 2068504038 | 2068503187 |
| Signal Strength: 5 of 6 | |
| Test ID: 690010 | |

| Extended Messaging Test Information | |
|---|------------------------|
| Name: SMS - T-Mobile to T-Mobile | |
| Start Time: 9/13/10 3:30:37 PM | |
| Finish Time: 9/13/10 3:30:43 PM | |
| Origination | Destination |
| Node: DAL.MMS.KWC.TMO.T559.3 | DAL.MMS.KWC.TMO.T559.4 |
| Location: Dallas, TX | Dallas, TX |
| Performance: 6.66 seconds | 6.66 seconds |
| Time to Send SMS 5.12 | 5.12 |
| Time to Receive SMS 1.54 | 1.54 |
| Max Latency: 180 seconds | |
| Network: T-Mobile | T-Mobile |
| Device: Samsung T559 | Samsung T559 |
| Phone Number: 2132717130 | 2132717997 |
| Signal Strength: 2 of 6 | |
| Test ID: 659254 | |

| Extended Messaging Test Information | |
|--|------------------------|
| Name: SMS - Verizon to Verizon | |
| Start Time: 9/14/10 2:01:29 AM | |
| Finish Time: 9/14/10 2:01:52 AM | |
| Origination | Destination |
| Node: DAL.MMS.VZW.VZW.A670.1 | DAL.MMS.VZW.VZW.A670.2 |
| Location: Dallas, TX | Dallas, TX |
| Performance: 23.05 seconds | 23.05 seconds |
| Time to Send SMS 5.56 | 5.56 |
| Time to Receive SMS 17.49 | 17.49 |
| Max Latency: 180 seconds | |
| Network: Verizon | Verizon |
| Device: Samsung A670 | Samsung A670 |
| Phone Number: 6507598324 | 2067196087 |
| Signal Strength: 3 of 4 | |
| Test ID: 684079 | |

| Extended Messaging Test Information | |
|---|------------------------|
| Name: SMS - MetroPCS to MetroPCS | |
| Start Time: 9/13/10 11:00:58 PM | |
| Finish Time: 9/13/10 11:01:02 PM | |
| Origination | Destination |
| Node: DAL.SMS.MET.MET.R350.1 | DAL.SMS.MET.MET.R350.2 |
| Location: Dallas, TX | Dallas, TX |
| Performance: 4.99 seconds | 4.99 seconds |
| Time to Send SMS 0 | 0 |
| Time to Receive SMS 4.99 | 4.99 |
| Max Latency: 300 seconds | |
| Network: MetroPCS | MetroPCS |
| Device: Samsung R350 | Samsung R350 |
| Phone Number: 2146227538 | 2146222692 |
| Signal Strength: 5 of 6 | |
| Test ID: 677009 | |

Close This Window

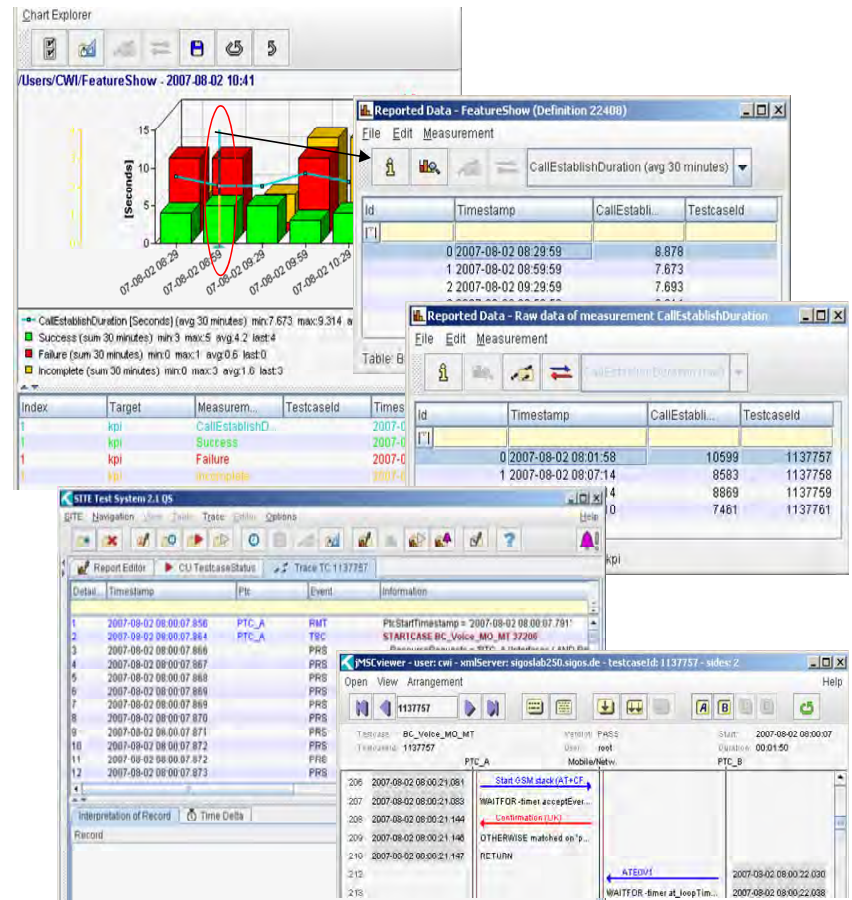
| Extended Messaging Test Information | |
|---|------------------------|
| Name: SMS - Boost to Boost | |
| Start Time: 9/14/10 12:31:13 AM | |
| Finish Time: 9/14/10 12:31:25 AM | |
| Origination | Destination |
| Node: DAL.SMS.MET.BOO.i776.1 | DAL.SMS.MET.BOO.i776.2 |
| Location: Dallas, TX | Dallas, TX |
| Performance: 12.5 seconds | 12.5 seconds |
| Time to Send SMS 10.11 | 10.11 |
| Time to Receive SMS 2.39 | 2.39 |
| Max Latency: 300 seconds | |
| Network: Boost | Boost |
| Device: Motorola i776 | Motorola i776 |
| Phone Number: 2144912513 | 2144912379 |
| Signal Strength: 3 of 4 | |
| Test ID: 680536 | |

Today's Agenda

1. Introductions & Keynote Overview
2. Leveling the Playing Field
3. Partner & SLA Management
4. Improving Troubleshooting Effectiveness
5. Q & A/Wrap-up

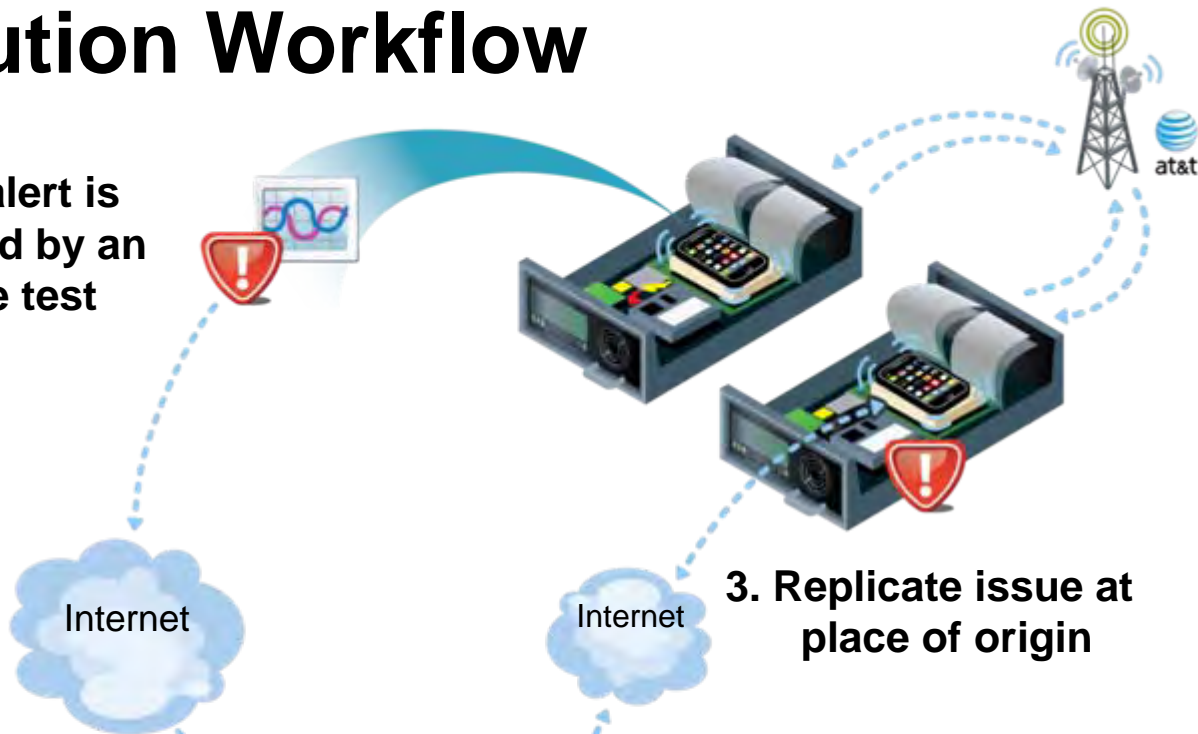
Keys to Improving Troubleshooting Effectiveness

- ✓ Constant monitoring & alarms – you can't fix it if you can't see it.
- ✓ Isolate the issue – dispatch to fix, not to find.
- ✓ Control costs and manage resources through remote diagnostics & repair.
- ✓ Your goal – know about it first!



Resolution Workflow

1. An alert is triggered by an active test



2. Investigate and begin troubleshooting



3. Replicate issue at place of origin

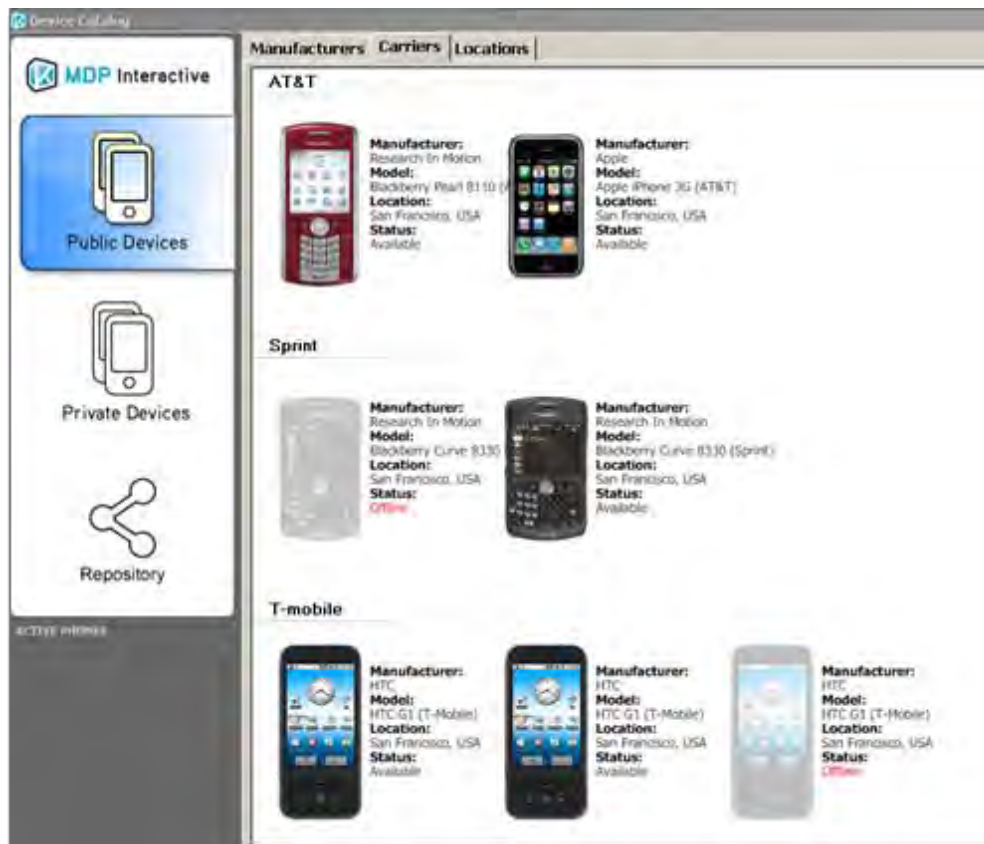


4. Send results to coworkers to help implement fix



Real Time Diagnostics

Replicate the issue with real devices



Device Catalog

MDP Interactive

Public Devices

Private Devices

Repository

Manufacturers Carriers Locations

AT&T

- Manufacturer:** Research In Motion
Model: BlackBerry Pearl 8110i
Location: San Francisco, USA
Status: Available
- Manufacturer:** Apple
Model: Apple iPhone 3G (AT&T)
Location: San Francisco, USA
Status: Available

Sprint

- Manufacturer:** Research In Motion
Model: BlackBerry Curve 8330
Location: San Francisco, USA
Status: Offline
- Manufacturer:** Research In Motion
Model: BlackBerry Curve 8330 (Sprint)
Location: San Francisco, USA
Status: Available

T-mobile

- Manufacturer:** HTC
Model: HTC G1 (T-Mobile)
Location: San Francisco, USA
Status: Available
- Manufacturer:** HTC
Model: HTC G1 (T-Mobile)
Location: San Francisco, USA
Status: Available
- Manufacturer:** HTC
Model: HTC G3 (T-Mobile)
Location: San Francisco, USA
Status: Offline



Apple iPhone Apple iPhone 3G (AT&T) (1811) AT&T USA San Francisco 2069798563

End Section

Session Time 00:15

Orientation vertical

Remove Battery

Connect USB

Capture Screen

Record

Send audio

Gesture Actions

- Tap
- Swipe
- Two Finger Tap
- Pinch
- Expand

Vibe

Backlights

Main LCD

Received DeviceInterface response

Today's Agenda

1. Introductions & Keynote Overview
2. Leveling the Playing Field
3. Partner & SLA Management
4. Improving Troubleshooting Effectiveness
5. Q & A/Wrap-up



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