# Testing UMTS Services Field Experience

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# What is Call Automation Tool?

- A system for measuring end-to-end availability and performance of service products

- Software scripts instruct the terminal to

  - set up a circuit-switched or data call

  - Voice or video Calls, SMS, MMS or IP packets containing the requests to interact with product servers

  - Measures round trip performance from Handset, Radio & Core, throughout to IT Systems
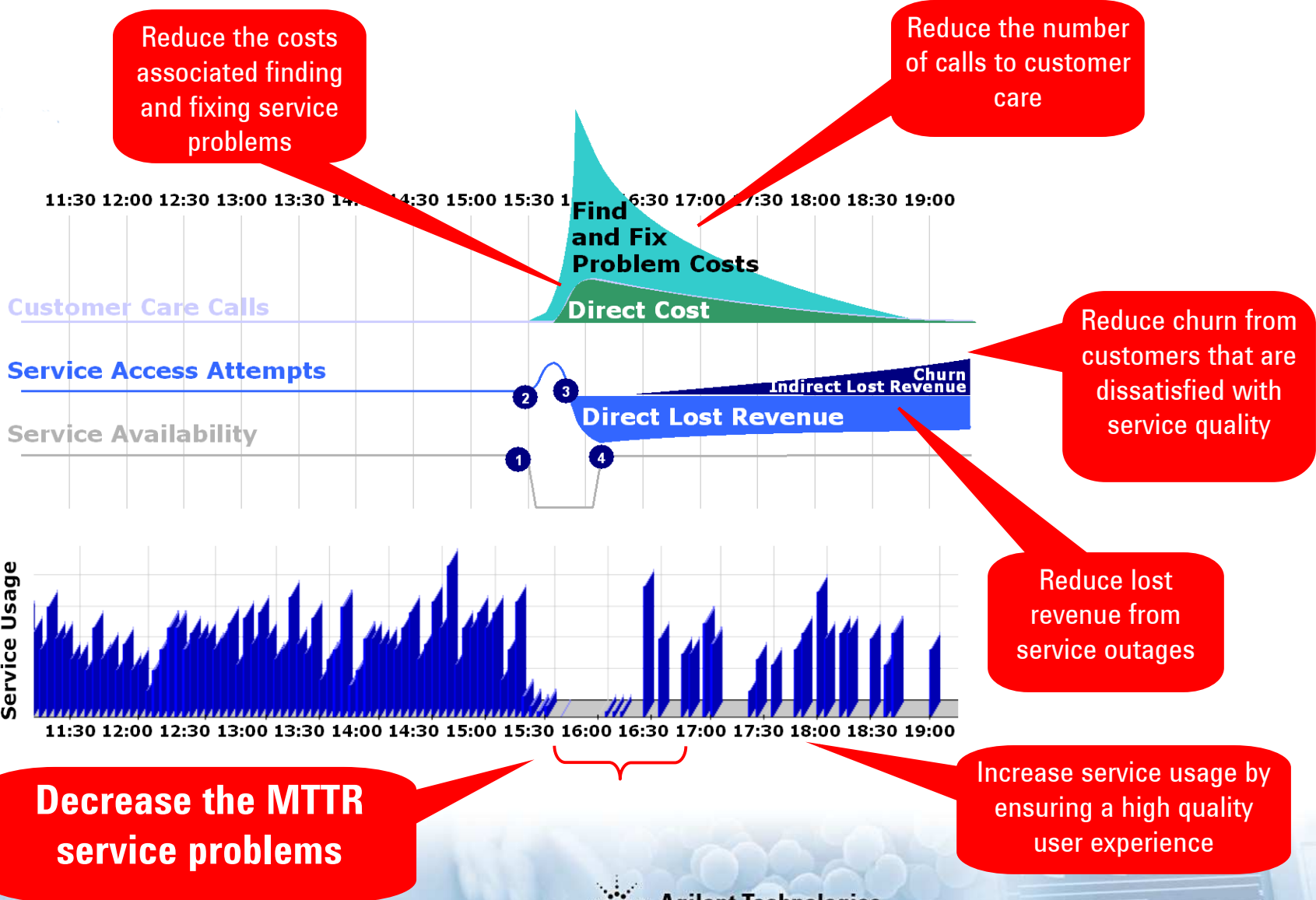
# Capabilities needed by Operators

Requirements involve different departemets bridging functions and responsability

- Automatically establish baseline service performance profiles
  - Troubleshoot service delivery issues by analyzing the baseline data
- Once a baseline is achieved, track service quality changes over time, providing the ability to react to slowly-degrading performance before customers do
- Perform regression testing to assess impact on service performance a a result of network upgrades and changes
- Perform country-wide ad hoc testing to troubleshoot the cause of "trouble tickets"
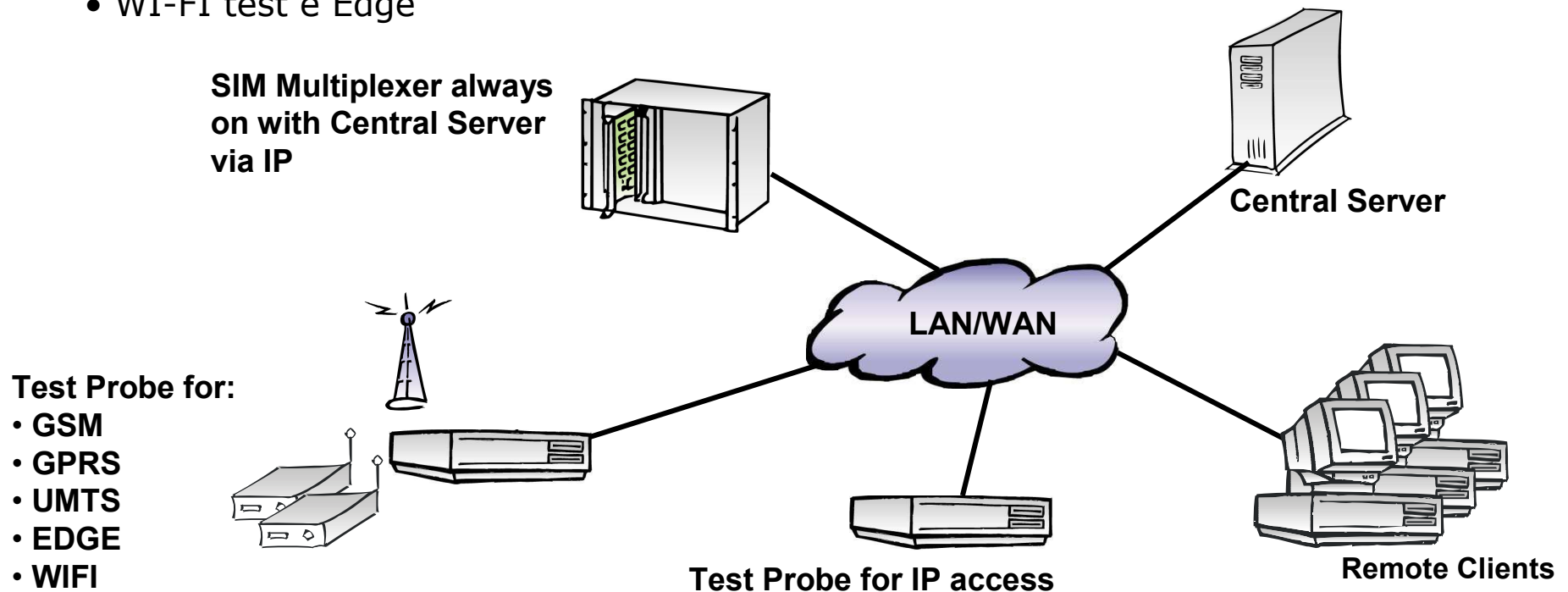
# Testing Value Proposition

Reduce the costs associated finding and fixing service problems

Reduce the number of calls to customer care

11:30 12:00 12:30 13:00 13:30 14:00 14:30 15:00 15:30 16:00 16:30 17:00 17:30 18:00 18:30 19:00

**Find and Fix Problem Costs**

**Customer Care Calls**

**Direct Cost**

**Service Access Attempts**

**Churn**

**Indirect Lost Revenue**

**Direct Lost Revenue**

**Service Availability**

2  3

1  4

Reduce churn from customers that are dissatisfied with service quality

Reduce lost revenue from service outages

Service Usage

11:30 12:00 12:30 13:00 13:30 14:00 14:30 15:00 15:30 16:00 16:30 17:00 17:30 18:00 18:30 19:00

**Decrease the MTTR service problems**

Increase service usage by ensuring a high quality user experience

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# Service Measurements and Monitoring Examples

| SMS KPI | Startvalue for SLO |
|---|---|
| SMS Delivery Time | Minor = 20 s  Critical = 40 s |
| SMS Mo-Mo Non-Accessibility | Minor = 34 % Critical = 67 % |
| SMS Delivery Time | Minor = 17 s  Critical = 25 s |
| SMS Mo-Mo Non-Accessibility | Minor = 34 % Critical = 67 % |

| MMS KPI | Startvalue for SLO |
|---|---|
| MMS E2E Delivery Time | Minor = 150 s Critical = 300 s |
| MMS Mo-Mo Non-Accessibility | Minor = 34 % Critical = 67% |
| MMS E2E Delivery Time | Minor = 150 s Critical = 300 s |
| MMS Mo-Mo Non-Accessibility | Minor = 34 % Critical = 67% |

| GPRS KPI | Startvalue for SLO |
|---|---|
| FTP Download Rate | Minor = 30 kBit/s Critical = 20 kBit/s |
| FTP Non-Accessibility | Minor = 34 % Critical = 67% |
| Ping Roundtrip Time | Minor = 1500 ms Critical = 2000 ms |
| Ping Failure Ratio | Minor = 34 % Critical = 67% |
| PDPC Activation Time | Minor = 5 s Critical = 10 s |
| PDPC Activation Failure Ratio | Minor = 34 % Critical = 67 % |
| PDPC Activation Time | Minor = 5 s Critical = 10 s |
| PDPC Activation Failure Ratio | Minor = 34 % Critical = 67 % |
| Attach Time | Minor = 10 s Critical = 15 s |
| Attach Failure Ratio | Minor = 33 % Critical = 67 % |

| WAP KPI | Startvalue for SLO |
|---|---|
| Portal Access Time | Minor = 35 s Critical = 50 s |
| Portal Non-Accesssibility | Minor = 22 % Critical = 42 % |
| Portal Access Time | Minor = 35 s Critical = 50 s |
| Portal Non-Accesssibility | Minor = 22 % Critical = 42 % |
| Site Access Time | Minor = 10 s Critical = 20s |
| Site Non-Accessibilty | Minor = 22 % Critical = 44 % |
| Mean Content Server Delay | Minor = 2.5 s Critical = 5.0 s |
| Content Server Delay > 4 s | Minor = 4.0 % Critical = 6.0 % |
| Content Server Delay > 8 s | Minor = 10.0 % Critical = 12.0 % |

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# Agilent Testing Service Capability

- Basic call, SMS, MMS, WAP, GPRS bearer, videostreaming, videocalls, Push Services
- Blackberry testing suite 'corporate' or 'ISP' services
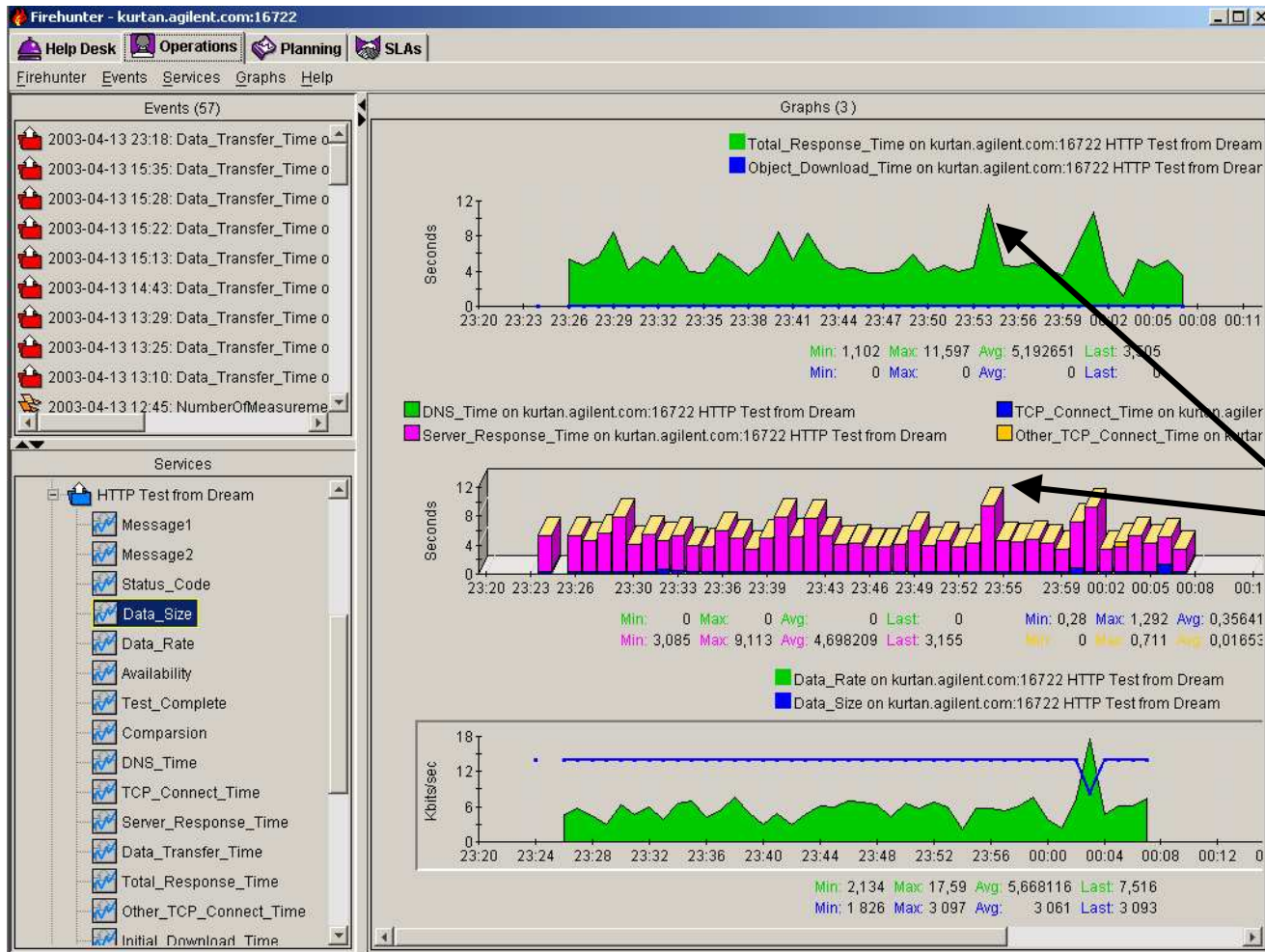- WI-FI test e Edge

**SIM Multiplexer always on with Central Server via IP**

**Central Server**

**LAN/WAN**

**Test Probe for:**
- **GSM**
- **GPRS**
- **UMTS**
- **EDGE**
- **WIFI**

**Test Probe for IP access**

**Remote Clients**

However, more and more frequently service testing involve a complete integration with both traditional OSS and BSS
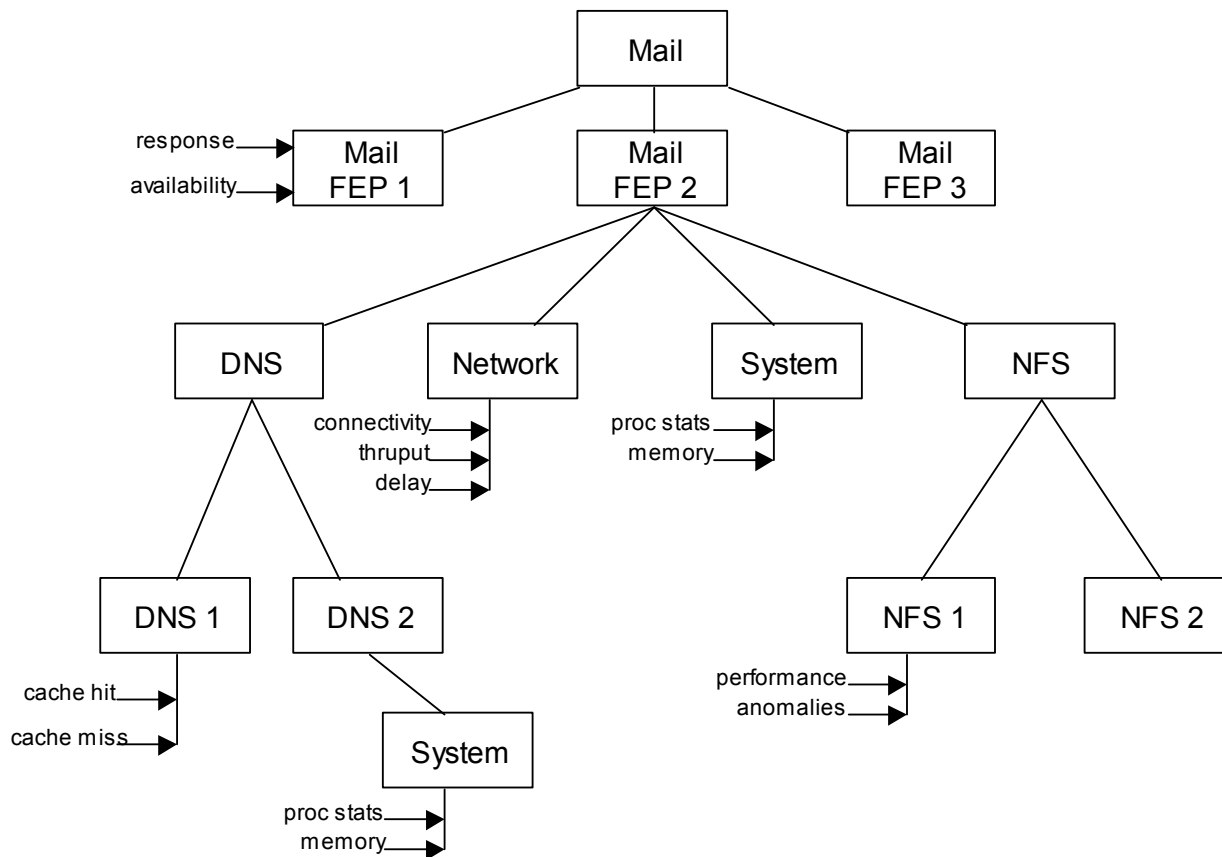
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# Service Performance Baseline



Continuously measure the performance of each service to establish a baseline

Use this data to troubleshoot IT issues with the service delivery

Note that the **Total Response Time** of this service is quite erratic, and that the largest delays are caused by the **Server Response Time**.
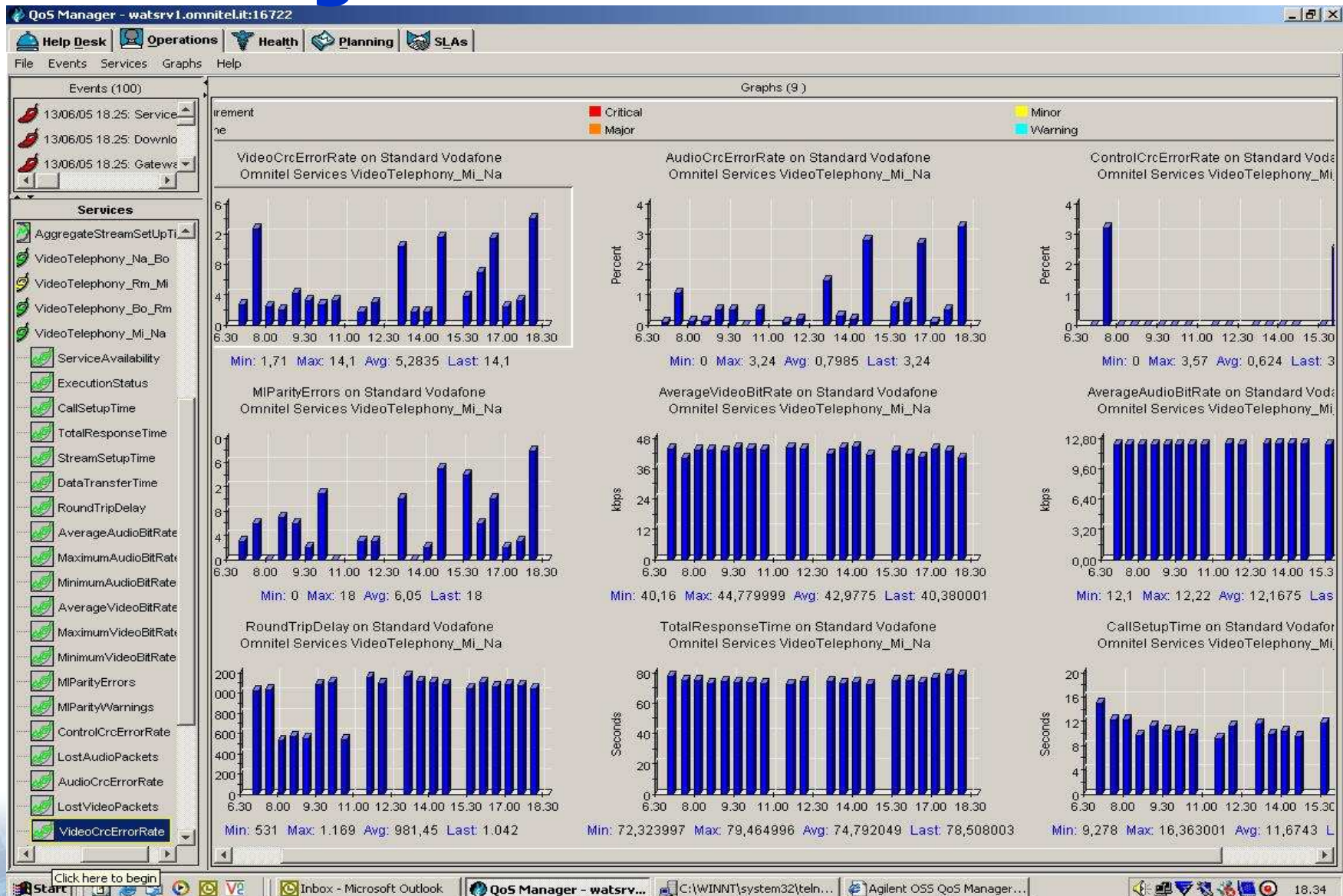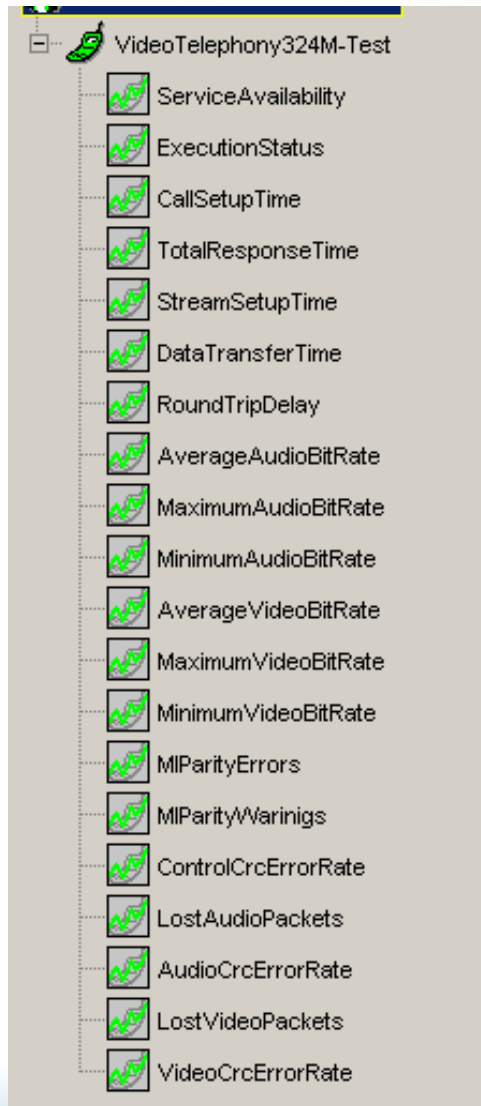
# Service Model
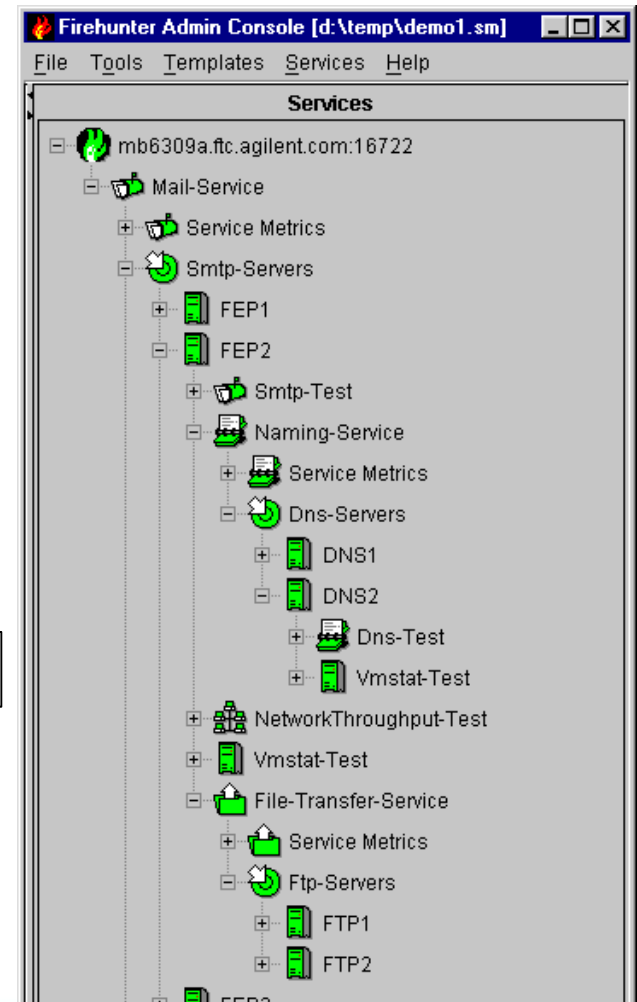
# UMTS Videocalls performance monitoring
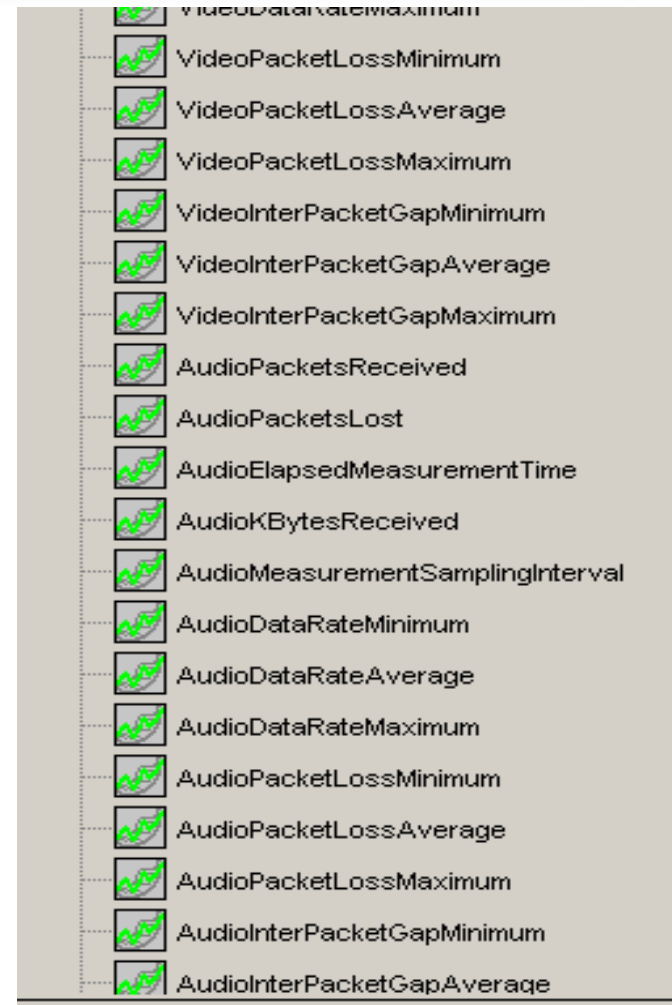
# Testing Video calls for UMTS

VideoTelephony324M-Test
- ServiceAvailability
- ExecutionStatus
- CallSetupTime
- TotalResponseTime
- StreamSetupTime
- DataTransferTime
- RoundTripDelay
- AverageAudioBitRate
- MaximumAudioBitRate
- MinimumAudioBitRate
- AverageVideoBitRate
- MaximumVideoBitRate
- MinimumVideoBitRate
- MlParityErrors
- MlParityWarinigs
- ControlCrcErrorRate
- LostAudioPackets
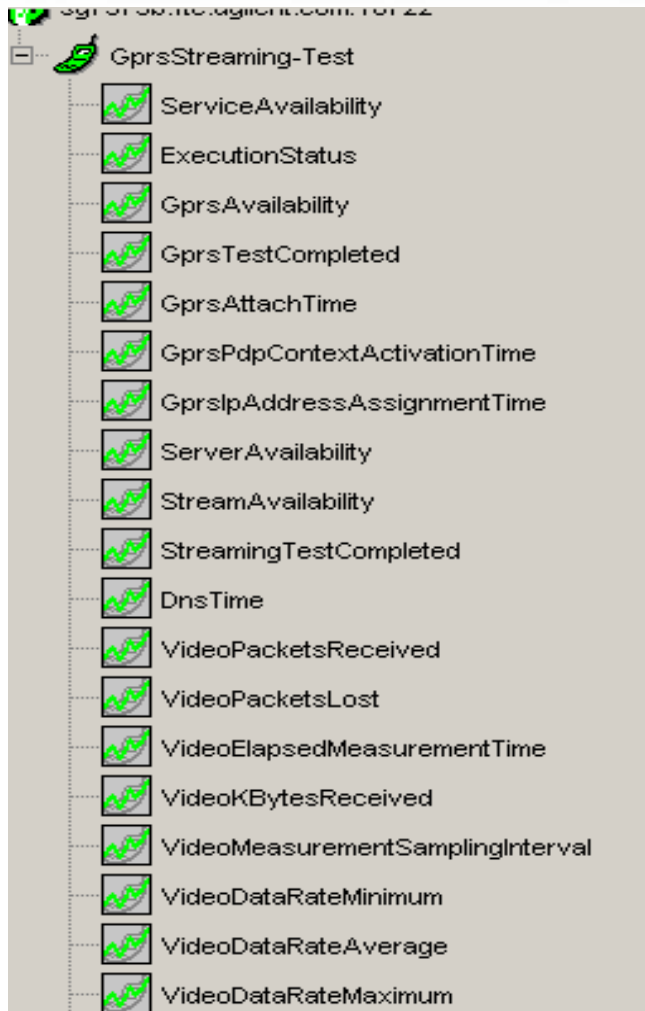- AudioCrcErrorRate
- LostVideoPackets
- VideoCrcErrorRate

*Video Telephony Test*
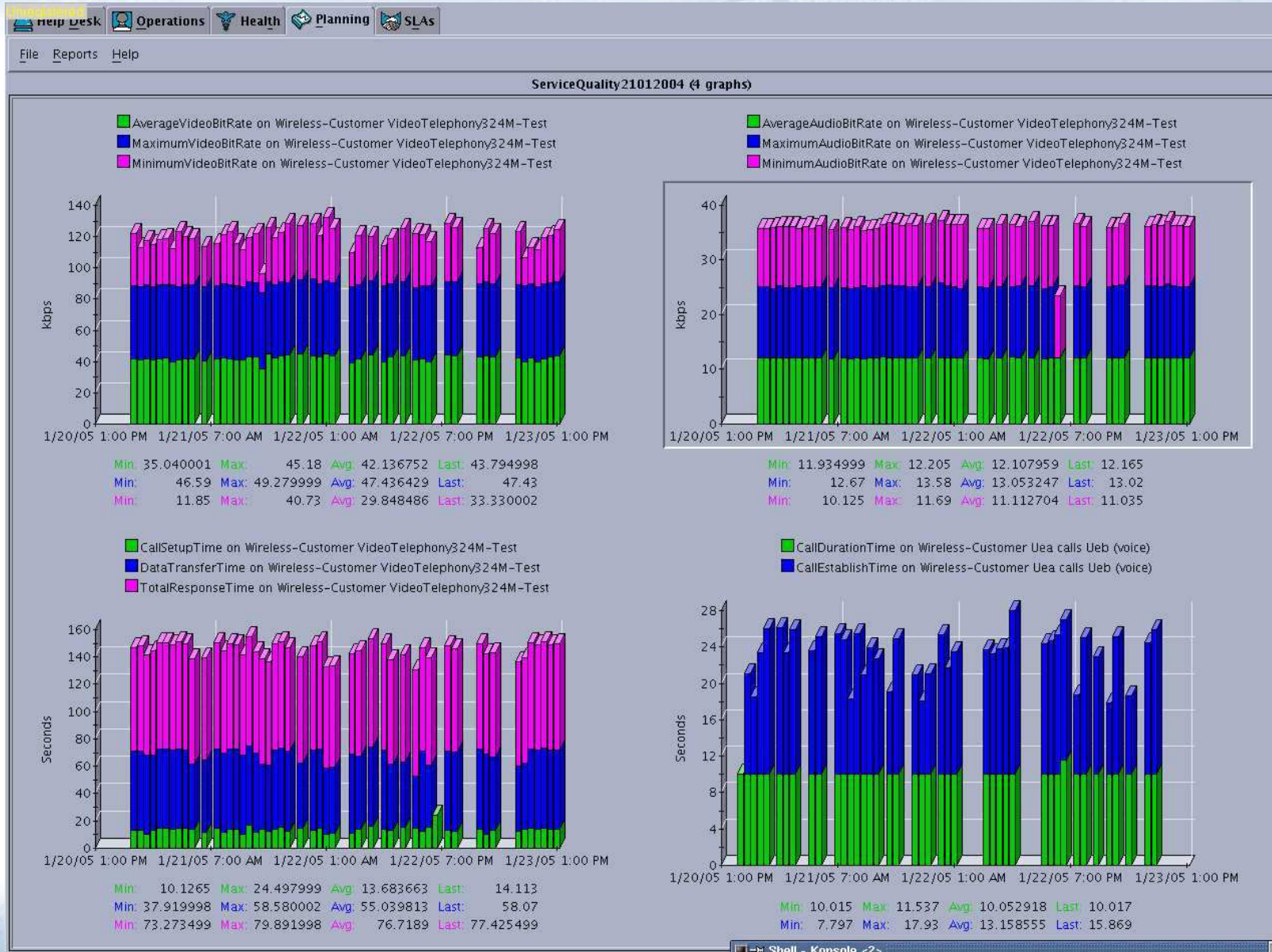*H324.M*

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# Audio-Video Streaming Test



*Streaming Performance Metrics for RTSP Streaming*

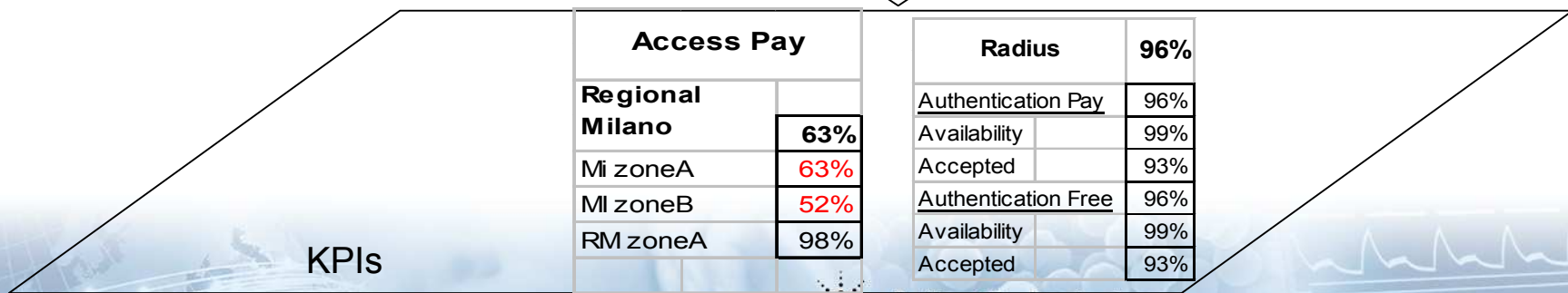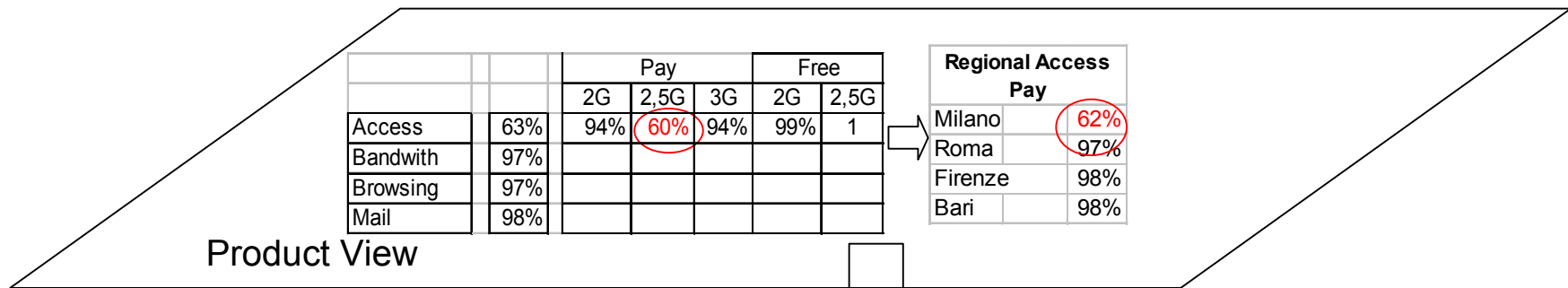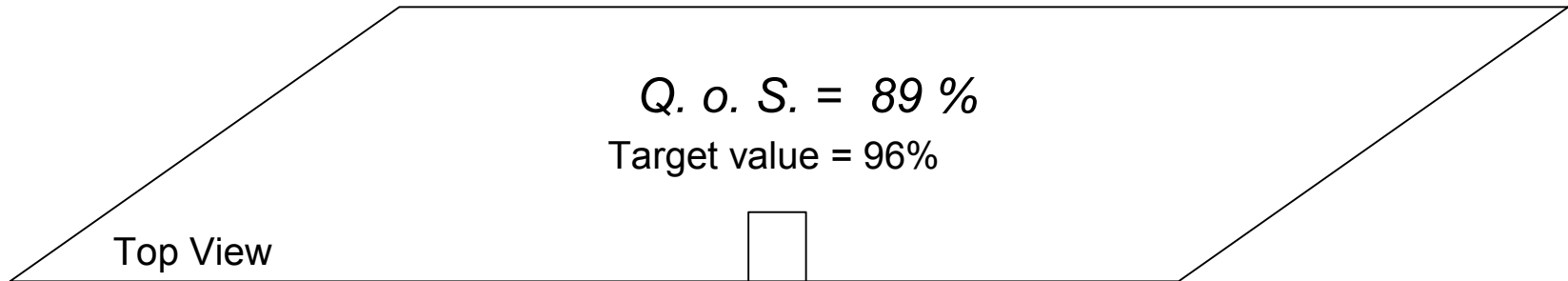Agilent Technologies

# Service Reporting

# QoS Objectives: details and syntesis



**Top View**

$$Q.\ o.\ S.\ =\ 89\ \%$$

Target value = 96%

**Product View**

| | | | Pay | | | Free | |
|---|---|---|---|---|---|---|---|
| | | | 2G | 2,5G | 3G | 2G | 2,5G |
| Access | 63% | | 94% | 60% | 94% | 99% | 1 |
| Bandwith | 97% | | | | | | |
| Browsing | 97% | | | | | | |
| Mail | 98% | | | | | | |

| Regional Access Pay | |
|---|---|
| Milano | 62% |
| Roma | 97% |
| Firenze | 98% |
| Bari | 98% |

**KPIs**

| Access Pay | |
|---|---|
| **Regional Milano** | **63%** |
| Mi zoneA | 63% |
| MI zoneB | 52% |
| RM zoneA | 98% |

| Radius | 96% |
|---|---|
| Authentication Pay | 96% |
| Availability | 99% |
| Accepted | 93% |
| Authentication Free | 96% |
| Availability | 99% |
| Accepted | 93% |

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# Thank you