

A woman wearing a colorful striped hijab and an orange blazer is sitting at a table in a bright, modern cafe. She is looking directly at the camera with a slight smile. In front of her is a silver laptop. To her right is a white mug filled with yellow roses. The table has a pink patterned tablecloth. In the background, other people are blurred, and large windows let in natural light.

# Measuring and monitoring Skype for Business service health

Microsoft IT Showcase Course

*Get ready to be what's next.*

# Agenda



Measuring Skype for Business  
(SfB) service health

Using monitoring tools

Measuring audio quality

Understanding the data

Best practices



# Measuring SfB service health



Defining telemetry

What do we look at?

Establishing service availability

Measuring service availability

# Defining telemetry

Telemetry is the  
process of  
collecting and  
aggregating data  
for reporting  
purposes

Collect data from  
multiple sources

Aggregate data and  
provide actionable  
reports

# What do we look at?



SCOM alerts

HPNA

Synthetic  
transactions

Client/server side  
logging

Data mining

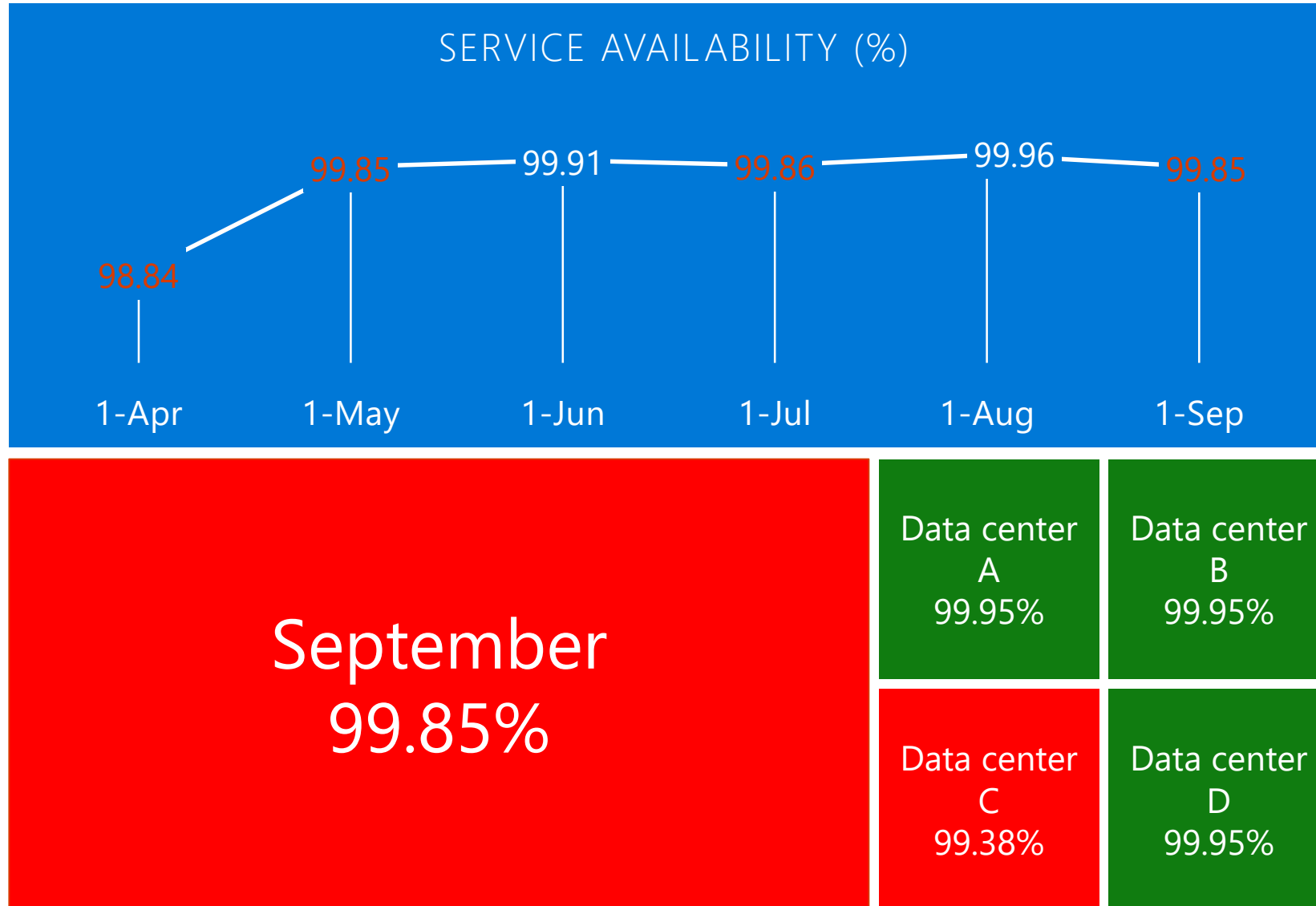
User NSAT  
reporting

Real-time

Incident

Tracking

# Establishing service availability



# Measuring service availability

SEPTEMBER	Target	Data center A	Data center B	Data center C	Data center D	Worldwide (weighted)
Core Infrastructure	99.90%	99.95%	99.95%	99.38%	99.95%	99.85%
Core SfB/Lync Conferencing	99.90%	99.90%	99.88%	99.38%	99.95%	99.81%
Enterprise Voice	99.70%	99.88%	99.86%	99.32%	99.91%	99.76%
Audio Conferencing	99.70%	99.89%	99.88%	99.33%	99.94%	99.80%
Online Meeting	99.90%	99.90%	99.88%	99.38%	99.95%	99.81%

# Summary

Service availability is measured using a process called telemetry. Data is tracked using real-time measurements and paying close attention to incidents and or monitoring alerts.



# Using monitoring tools



Using System Center  
Operations Manager (SCOM)  
HP Network Automation  
(HPNA) reporting  
Establishing service availability  
SfB/Lync monitoring server

# Using System Center Operations Manager

## Alert/Bug Volumes

2013 September  
Corp

### Total Alert Volume

SOC Monitored Servers	167
Total Alerts	21361
Total Bugs	57
Alert:Server	127.9
Alert:Bug	374.8

### W15 Alert Volume

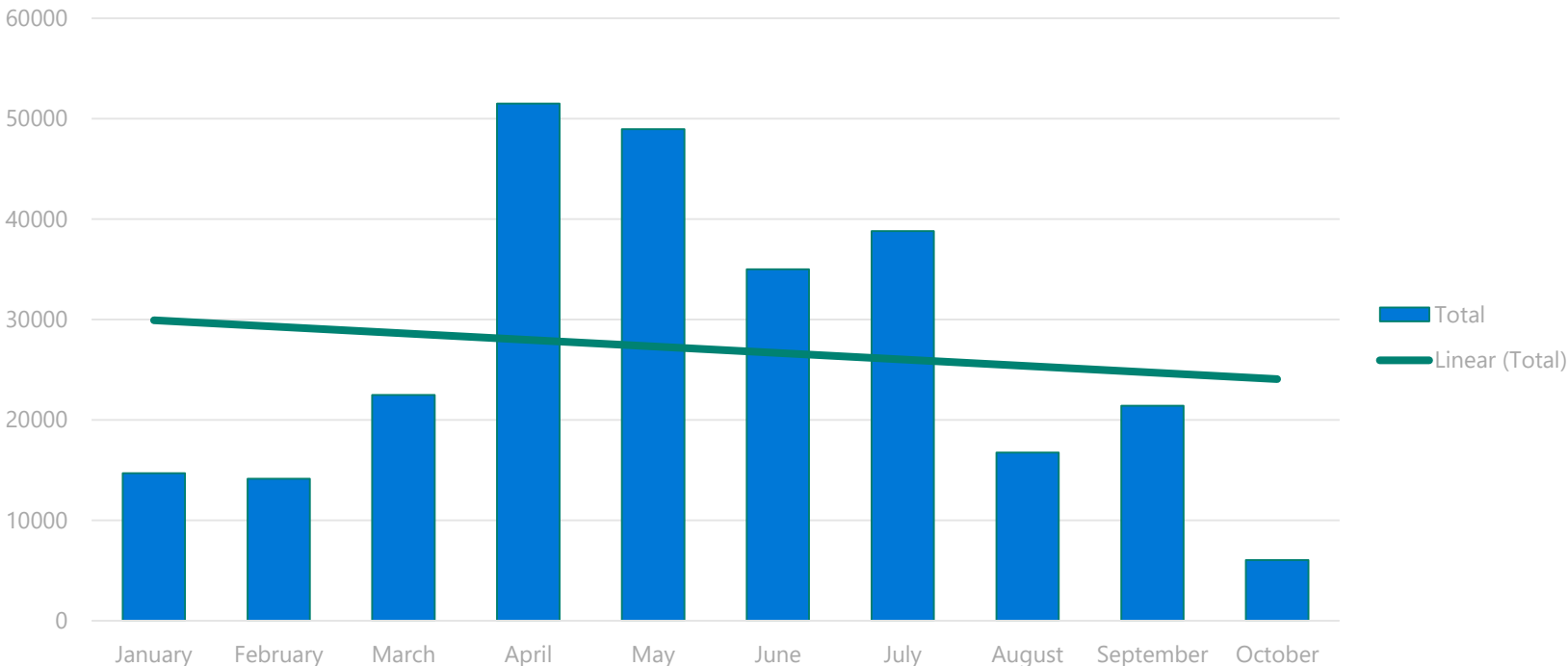
W15 Server	64
W15 Alerts	19254
W15 No TSG	14252
W15 Bugs	36
Alert:Server	300.8
Alert:Bug	534.8

### W14 Alert Volume

W14 Server	103
W14 Alerts	1631
W14 No TSG	1541
W14 Bugs	8
Alert:Server	15.8
Alert:Bug	203.9

% Resolved By SOC	93
-------------------	----

## Alert Totals - Month



### Top Alerts

	Total Alerts	TSG
[LYNC] Connection attempt to at least one service in a pool failed.	7881	✗
[LYNC] The number of requests that were rejected because per-application queue limit was exceeded	2073	✓
[LYNC] Total number of Storage Service OAuth STS request failures.	1789	✓
[LYNC] The total number of requests currently being processed by application.	1340	✗
[LYNC] The average time (in seconds) the messages delayed in outgoing (send) queues.	1152	✗

# HP Network Automation (HPNA) reporting

FILEMESSAGE

Ignore

Reply

Forward

IM

More

Meeting

Team Email

Reply & Delete

Nokia

To Manager

Done

Create New

Rules

OneNote

Actions

Assign Policy

Mark Unread

Categorize

Follow Up

Translate

Find

Related

Select

Zoom

Delete

Respond

Quick Steps

Move

Tags

Editing

Zoom

Mon 1/6/2014 6:00 AM

NPR Tools

Global QoS Report - Non-Compliant Devices

To Judith Maurer FTEs; Brent Hermanson; Sunil Venugopal; Connie Welsh; Jonathan Lewis; Bert Byerly; Wayne Lewis; Garland Ellis; Steve Kern; Dave Gasiewicz; Sean O'Neill; Farooq Mohammed (HCL Technologies Ltd); Syed Jaleel (HCL Technologies Ltd); Devin Murray

To Me

If there are problems with how this message is displayed, click here to view it in a web browser.

Who's Who

Get more apps

Total Results: 10

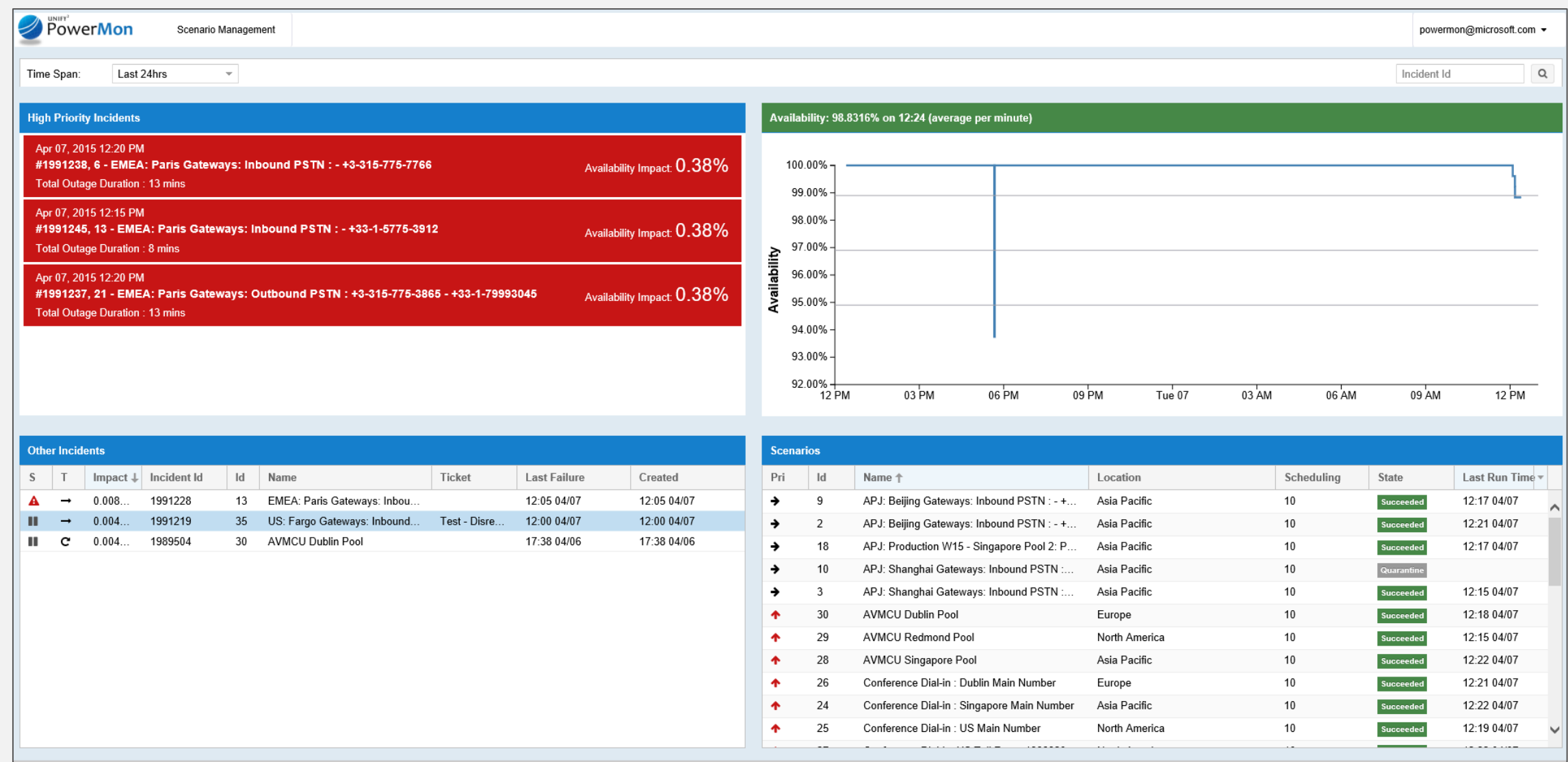
Host Name	Policy Compliance	BuildingName	Region	Actions
ccnshabysc6n01	No			Edit   Telnet   SSH   View Config
cusrenrenc6n01	No			Edit   Telnet   SSH   View Config
CUSTUKTK5C6N23	No			Edit   Telnet   SSH   View Config
CUSTUKTK5C6N24	No			Edit   Telnet   SSH   View Config
CUSTUKTK5C6N61	No			Edit   Telnet   SSH   View Config
CUSTUKTK5C6N62	No			Edit   Telnet   SSH   View Config
CUSTUKTK5C6N65	No			Edit   Telnet   SSH   View Config
CUSTUKTK5C6N67	No			Edit   Telnet   SSH   View Config
CUSTUKTK5C6N69	No			Edit   Telnet   SSH   View Config
CUSTUKTK5C6N71	No			Edit   Telnet   SSH   View Config

Search Criteria

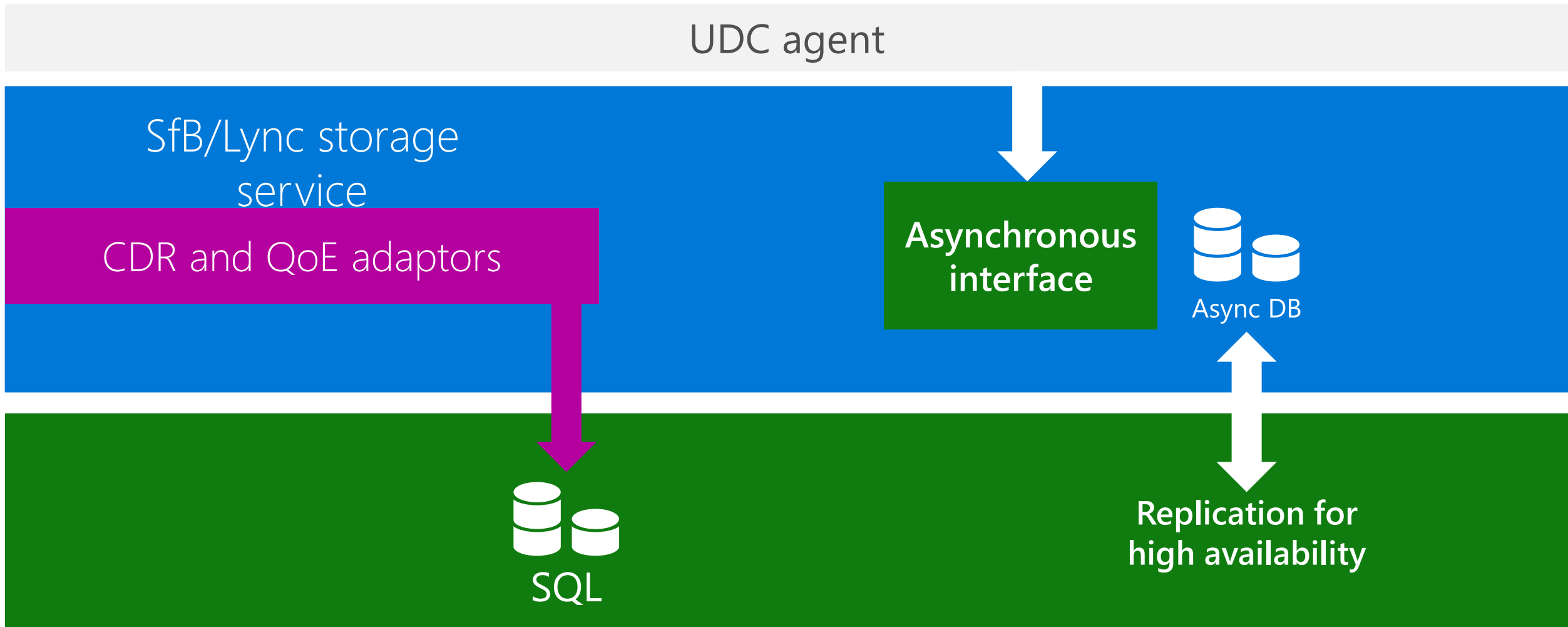
- Device Status is Active
- Device not in compliance
- Non-Compliant with Selected Policies equals 'Cisco ISR QOS' OR 'QOS 2960' OR 'QOS 7206' OR 'Cisco 4506E QOS' OR 'Cisco 3560 QOS' OR 'Cisco 6500 QOS'
- Device is in any of the following Site groups: Default Site

Search performed by Sean Adams at Jan-06-14 06:00:00 on HP Network Automation server <https://TKSIMENACORE03.redmond.corp.microsoft.com/>

# Establishing service availability



# SfB/Lync monitoring server





# Summary

There are a number of monitoring tools used with Skype for Business. These include System Center Operations Manager (SCOM), and HP Network Automation (HPNA).

# Measuring audio quality



Characteristics of a poor audio call

SfB/Lync call quality methodology

Call quality dashboard

# Characteristics of a poor audio call



RatioConcealed  
SamplesAvg  
> 7% (0.07)

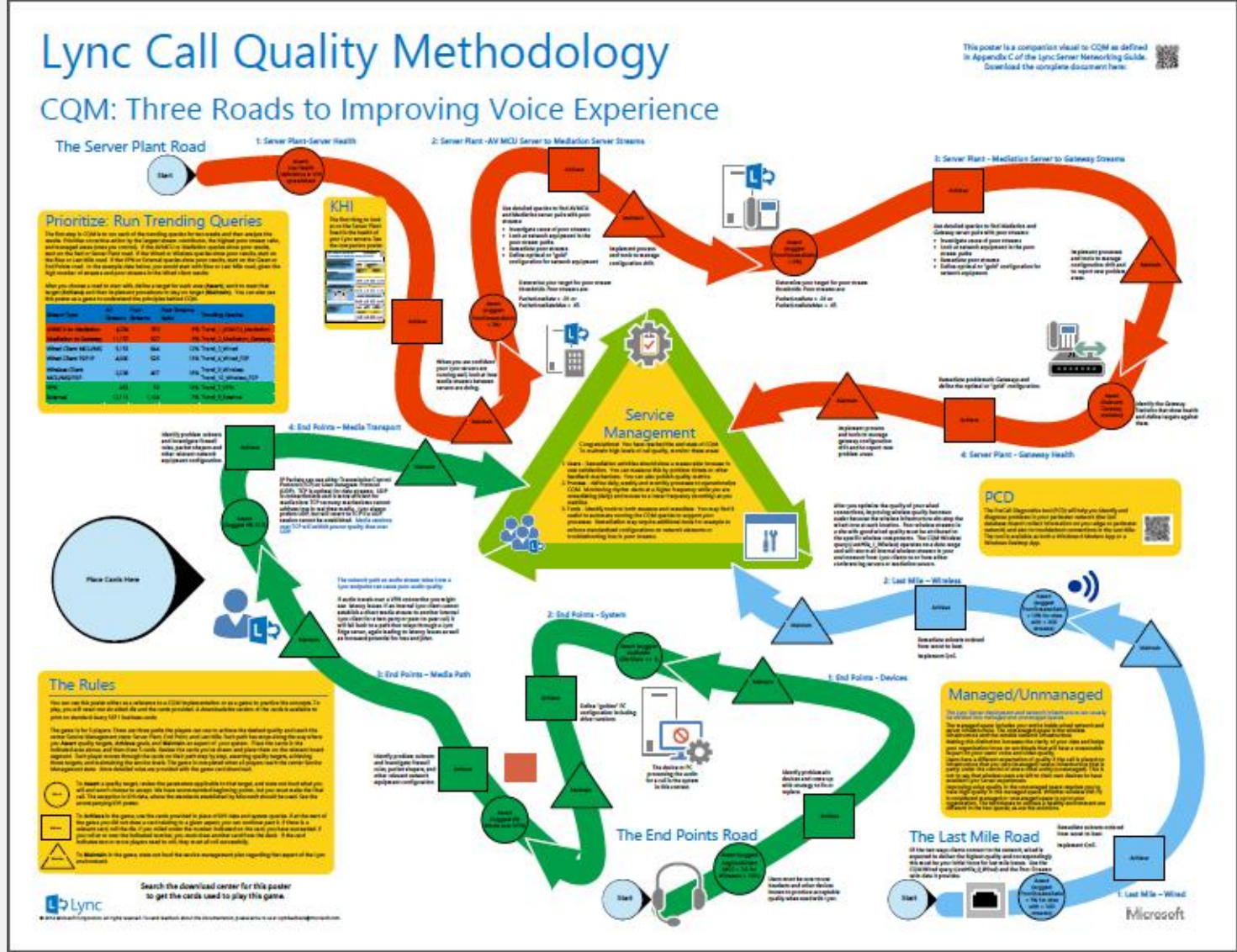
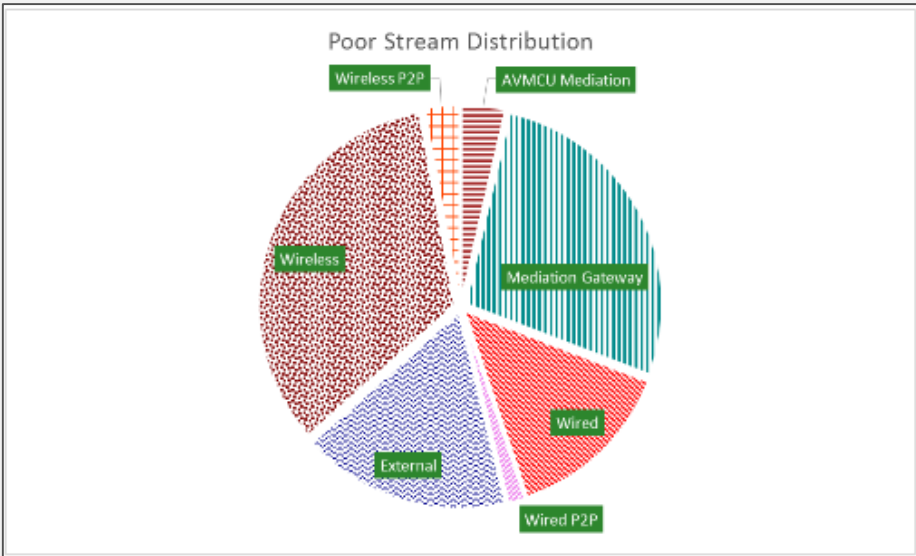
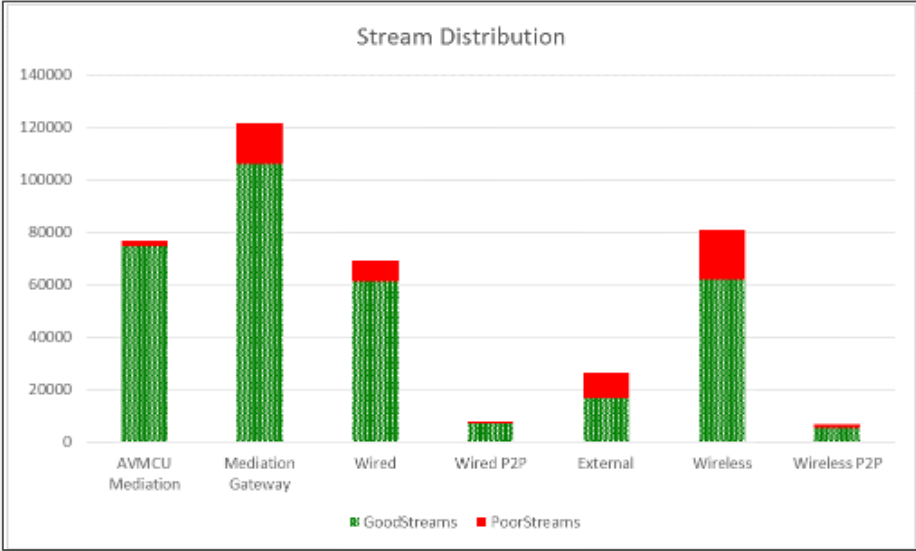
PacketLossRate  
> 10% (0.1)

JitterInterArrival  
> 30ms

RoundTrip  
> 500ms

DegradationAvg  
> 1.0

# SfB/Lync call quality methodology



# Call quality dashboard



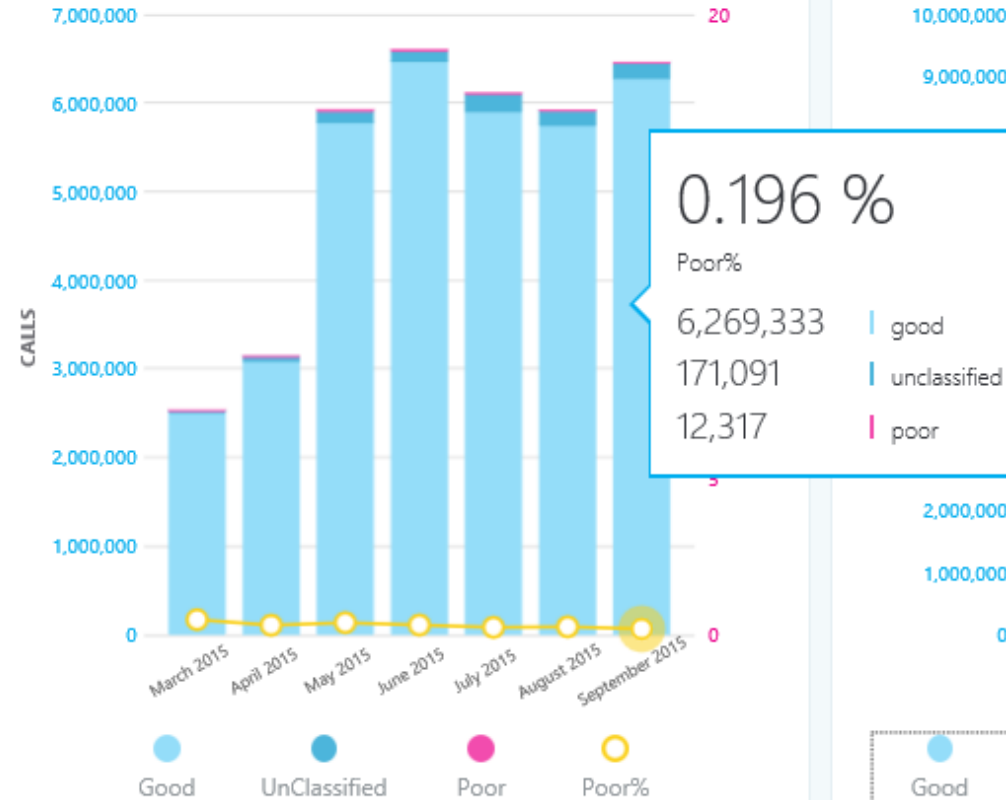


# Call quality dashboard

jclare — All Audio Streams / Managed vs Unmanaged Audio Streams

Managed Audio Streams Monthly Trend

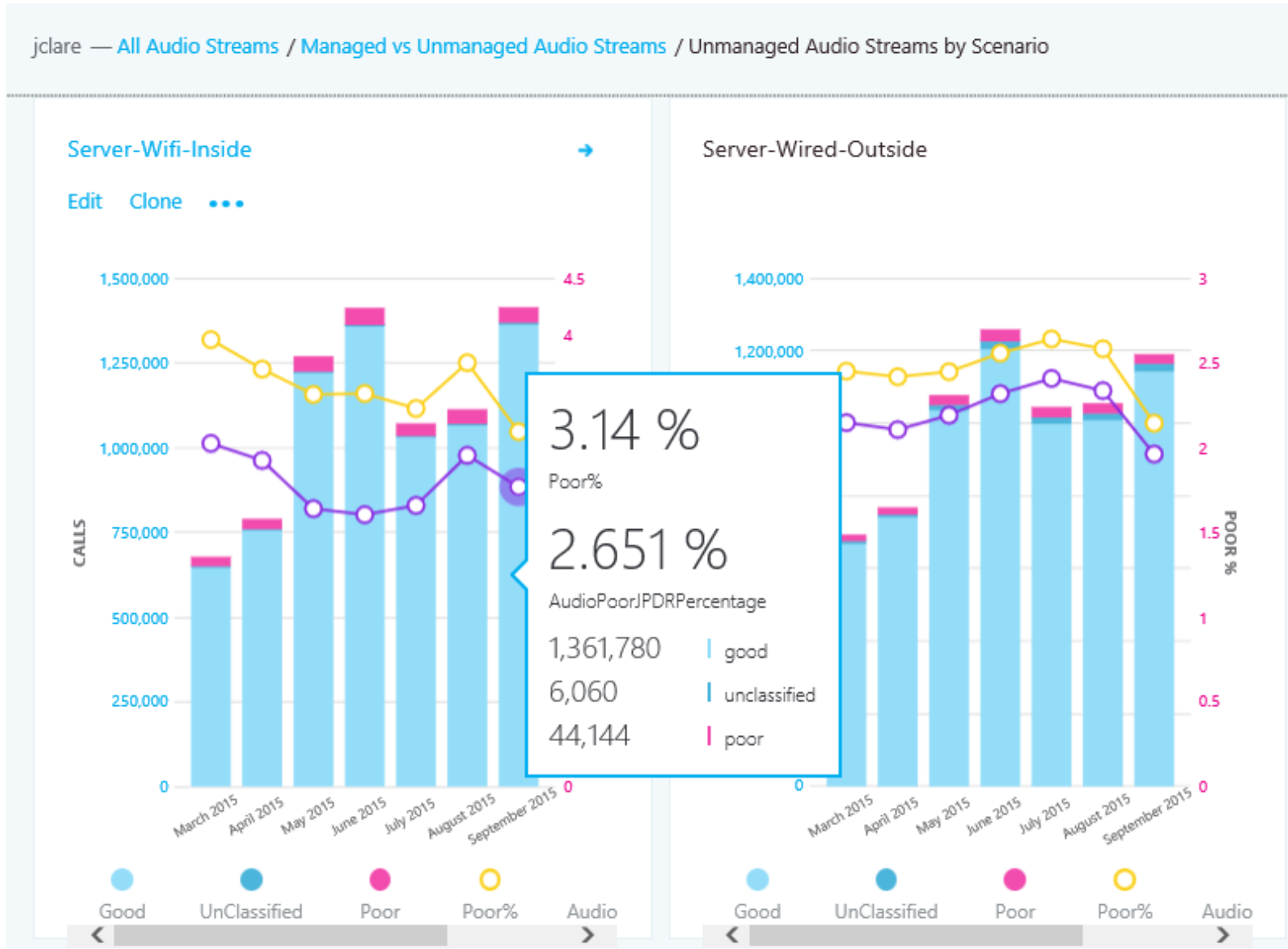
Edit Clone ...



Unmanaged Audio Streams Monthly Trend



# Call quality dashboard





















# Call quality dashboard

Server-Wifi-Inside - Best Subnets



[Edit](#) [Clone](#) [Add Sub-Report](#) [...](#)

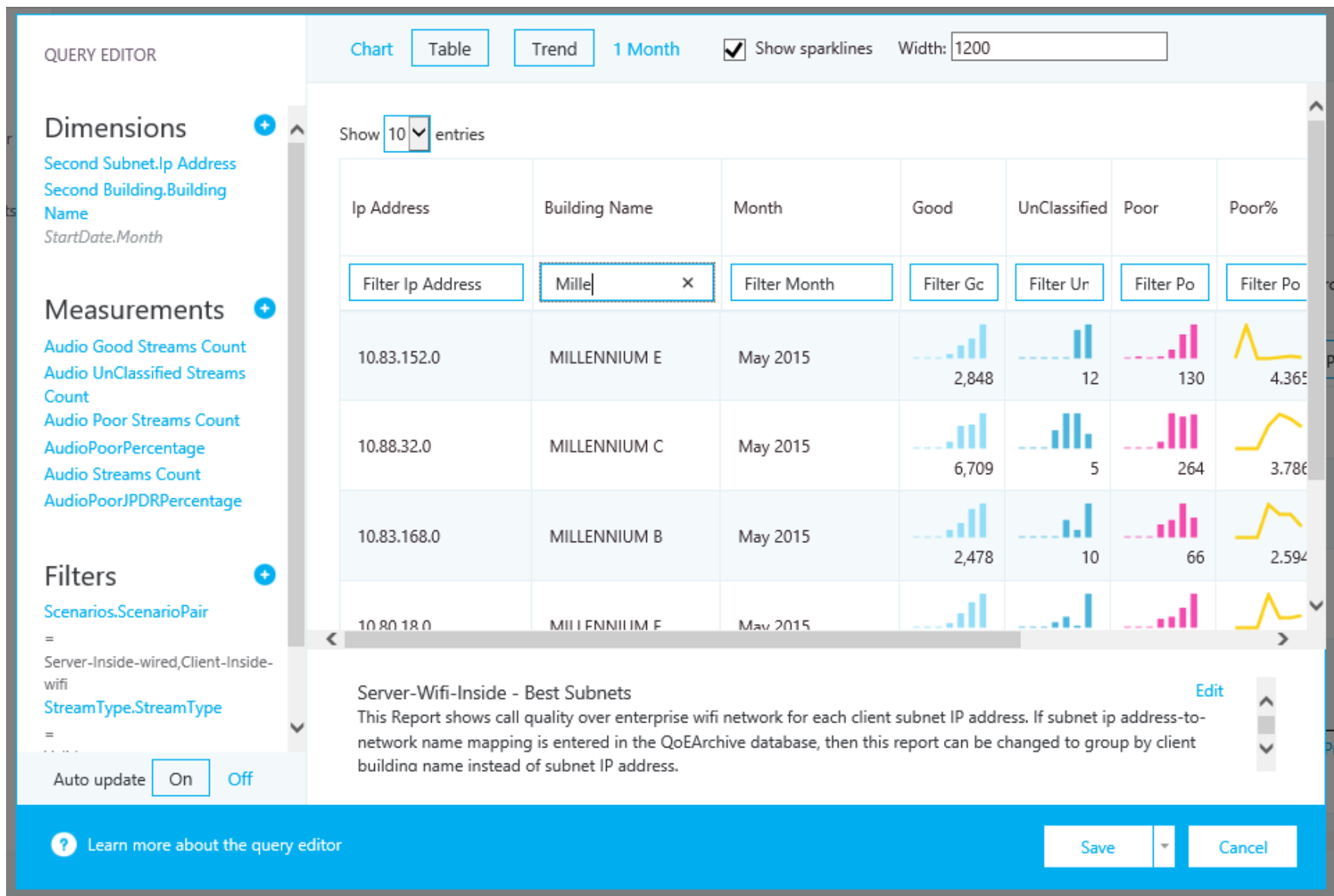
Show  entries

Ip Address	Building Name	Month	Good	UnClassified	Poor	Poor%	Audio Streams Count	AudioPoorJPDRPercentage
<a href="#">Filter Ip Address</a>	<a href="#">Millennium</a>	<a href="#">Filter Month</a>	<a href="#">Filter Gc</a>	<a href="#">Filter Un</a>	<a href="#">Filter Po</a>	<a href="#">Filter Po</a>	<a href="#">[0-9][0-9]</a>	<a href="#">Filter AudioPoorJPDRPe</a>
10.80.18.0	MILLENNIUM F	September 2015	 5,069	 29	 108	 2.086	 5,206	 1.893
10.83.152.0	MILLENNIUM E	September 2015	 2,216	 8	 40	 1.773	 2,264	 1.596
10.82.108.0	MILLENNIUM A	September 2015	 766	 4	 8	 1.034	 778	 1.034

Showing 1 to 5 of 5 entries (filtered from 6,341 total entries)

[Previous](#) [Next](#)

# Call quality dashboard



# Summary

The call Quality Dashboard follows the Call Quality Methodology (CQM) and provides an alternative to the scorecard included in the Lync Networking Guide.



# Understanding the data



QoE queries and data collection  
CDR queries and data collection  
Trend analysis  
Diagnostic logs  
Custom SQL Reporting Services  
Reports

# QoE queries and data collection

The screenshot displays the Microsoft SQL Server Management Studio (SSMS) interface. The title bar indicates the connection is to 'US-SQL\RTC.master (HADRLAB\administrator (126))\*'. The Object Explorer on the left shows the 'QoEMetrics' database structure, including 'System Views' and various 'dbo' views. The central query editor shows the following SQL query:

```
SELECT *
FROM [QoEMetrics].[dbo].[QoEReportsCallDetailView]
WHERE CallerURI = 'sip:ususer@hadr1ab.com' or CalleeURI = 'sip:ususer@hadr1ab.com'
```

The 'Results' pane at the bottom displays 12 rows of data. The status bar at the bottom indicates the query was executed successfully, returning 12 rows.

	ConferenceDate Time	SessionSeq	DialogCategory	MediationServerBypassFlag	MediaBypassWarningFlag	StartTime	EndTime	Com...
1	2013-02-05 18:45:00.167	1	0	0	NULL	2013-02-05 18:43:43.010	2013-02-05 18:44:54.087	NUL
2	2013-02-05 18:45:00.167	1	0	0	NULL	2013-02-05 18:43:43.010	2013-02-05 18:44:54.087	NUL
3	2013-02-05 19:10:55.727	1	0	0	NULL	2013-02-05 18:52:40.000	2013-02-05 19:10:50.027	NUL
4	2013-02-05 19:10:55.727	1	0	0	NULL	2013-02-05 18:52:40.000	2013-02-05 19:10:50.027	NUL
5	2013-02-05 23:57:23.260	1	0	0	NULL	2013-02-05 23:51:56.100	2013-02-05 23:57:21.000	NUL
6	2013-02-05 23:57:23.260	1	0	0	NULL	2013-02-05 23:51:56.100	2013-02-05 23:57:21.000	NUL
7	2013-02-05 23:58:40.213	1	0	0	NULL	2013-02-05 23:58:20.147	2013-02-05 23:58:33.257	NUL
8	2013-02-05 23:58:40.213	1	0	0	NULL	2013-02-05 23:58:20.147	2013-02-05 23:58:33.257	NUL
9	2013-02-06 00:01:21.313	1	0	0	NULL	2013-02-06 00:01:00.163	2013-02-06 00:01:14.687	NUL
10	2013-02-06 00:01:21.313	1	0	0	NULL	2013-02-06 00:01:00.163	2013-02-06 00:01:14.687	NUL
11	2013-02-06 01:10:27.910	1	0	0	NULL	2013-02-06 01:08:04.060	2013-02-06 01:10:20.063	17
12	2013-02-06 01:10:27.910	1	0	0	NULL	2013-02-06 01:08:04.060	2013-02-06 01:10:20.063	17

# CDR queries and data collection

The screenshot displays the Microsoft SQL Server Management Studio (SSMS) interface. The title bar indicates the active query is 'SQLQuery4.sql - US-SQL\RTC.master (HADRLAB\administrator (127))\* - Microsoft SQL Server Management Studio (Administrator)'. The Object Explorer on the left shows the 'LcsCDR' database structure, including 'Database Diagrams', 'Tables', and 'Views'. The 'Views' folder is expanded, listing various views such as 'dbo.CDRReportsConferenceSessionDetailsBaseView', 'dbo.CDRReportsConferenceSessionDetailsSummaryView', 'dbo.CDRReportsConferenceSessionWithInstanceView', 'dbo.CDRReportsConferencesView', 'dbo.CDRReportsErrorReportBaseView', 'dbo.CDRReportsErrorReportWithErrorDefView', 'dbo.CDRReportsFocusJoinsAndLeavesView', 'dbo.CDRReportsMcuJoinsAndLeavesBaseView', 'dbo.CDRReportsMcuJoinsAndLeavesSummaryView', 'dbo.CDRReportsPoolListView', 'dbo.CDRReportsRegisteredUsersView', 'dbo.CDRReportsRegistrationBaseView', 'dbo.CDRReportsSessionDetailsBaseView', 'dbo.CDRReportsSessionDetailsSummaryView', 'dbo.ClientVersionsView', 'dbo.ConferenceMessageCountView', 'dbo.ConferenceSessionDetailsView', 'dbo.ConferenceUriView', 'dbo.ConferencesView', 'dbo.DbIndexStatsView', 'dbo.ErrorReportView', 'dbo.FileTransfersView', 'dbo.FocusJoinsAndLeavesView', 'dbo.McuJoinsAndLeavesView', 'dbo.McusView', 'dbo.MediaView', 'dbo.MsDiagMetaView', 'dbo.ProgressReportView', 'dbo.RegistrationView', 'dbo.SessionDetailsView' (highlighted), 'dbo.UsersForEnterpriseCALView', 'dbo.UsersForPlusCALView', 'dbo.UsersView', and 'dbo.VoipDetailsView'. The main query editor shows the following SQL query:

```
SELECT *
FROM [LcsCDR].[dbo].[SessionDetailsView]
WHERE DiagnosticId = 10407
```

The Results pane at the bottom displays the query output as a table with 6 rows and 9 columns. The status bar at the bottom indicates 'Query executed successfully.' and 'US-SQL\RTC (11.0 RTM) | HADRLAB\administrator ... | master | 00:00:00 | 6 rows'.

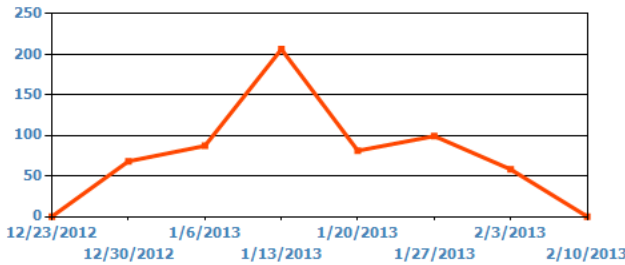
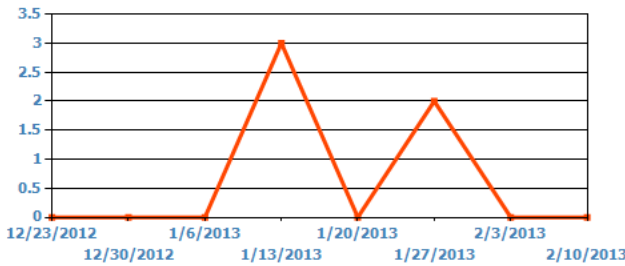
	SessionIdTime	SessionIdSeq	InviteTime	FromUri	ToUri	FromUriType	ToUriType	FromTenant
1	2013-02-06 00:04:58.627	1	2013-02-06 00:04:52.610	ususer@hadrlab.com	60001@hadrlab.com:user-phone	UserUri	UserUri	00000000-0000-0000-
2	2013-02-06 00:05:50.370	1	2013-02-06 00:05:50.370	ususer@hadrlab.com	60001@hadrlab.com:user-phone	UserUri	UserUri	00000000-0000-0000-
3	2013-02-06 00:07:22.317	1	2013-02-06 00:07:22.317	ususer@hadrlab.com	60001@hadrlab.com:user-phone	UserUri	UserUri	00000000-0000-0000-
4	2013-02-06 00:08:39.587	1	2013-02-06 00:08:36.863	ususer@hadrlab.com	60001@hadrlab.com:user-phone	UserUri	UserUri	00000000-0000-0000-
5	2013-02-06 00:12:33.743	1	2013-02-06 00:12:31.037	ususer@hadrlab.com	60001@hadrlab.com:user-phone	UserUri	UserUri	00000000-0000-0000-
6	2013-02-06 00:15:51.470	1	2013-02-06 00:15:48.737	ususer@hadrlab.com	60001@hadrlab.com:user-phone	UserUri	UserUri	00000000-0000-0000-

# Trend analysis

## Top Failures Report

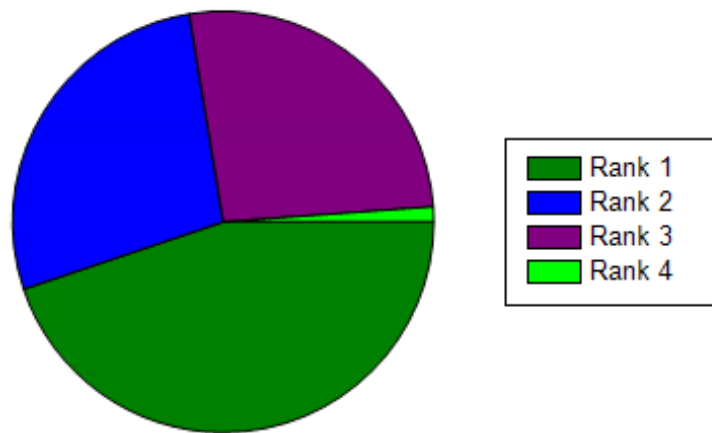
From: 1/18/2013 11:40:00 AM

To: 2/13/2013 11:40:00 AM

Rank	Reported sessions	Users impacted	Failure information				Weekly volume trend in the past
1	261	138	Request:	INVITE	Response:	503	
			Diagnostic ID:	12000	Category:	Unexpected	
			Component:	VoIP Outbound Routing: Front End Server			
			Reason:	Routes available for this request but no available gateway at this point			
			Description:				
			The user's call could not be routed because all available PSTN gateways have been marked as down. Administrators should check the caller's voice policy to see where the dialed number would be routed, and verify that specified gateways are all functioning properly. Diagnostics sent in provisional responses may contain more information on the failures received from the gateways.				
2	2	2	Request:	NONE	Response:	503	
			Diagnostic ID:	12000	Category:	Unexpected	
			Component:	VoIP Outbound Routing: Front End Server			
			Reason:	Routes available for this request but no available gateway at this point			
			Description:				
			The user's call could not be routed because all available PSTN gateways have been marked as down. Administrators should check the caller's voice policy to see where the dialed number would be routed, and verify that specified gateways are all functioning properly. Diagnostics sent in provisional responses may contain more information on the failures received from the gateways.				

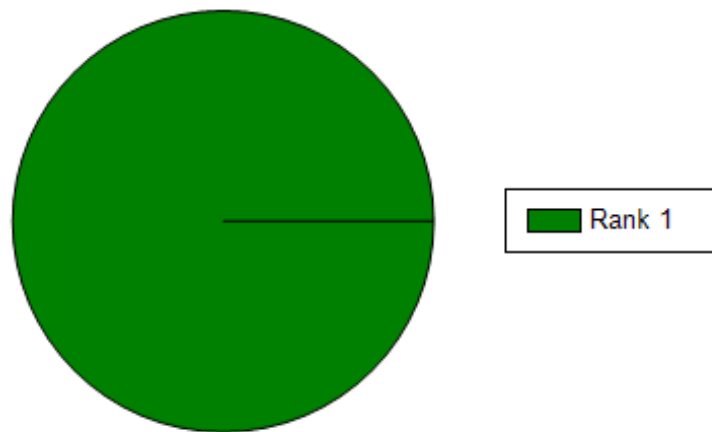
# Trend analysis

Session Distribution by Top Sources



Rank	Top sources	Sessions
1	FrontEnd3.contoso.com	117
2	FrontEnd2.contoso.com	72
3	FrontEnd4.contoso.com	69
4	FrontEnd6.contoso.com	3

Session Distribution by Top Components

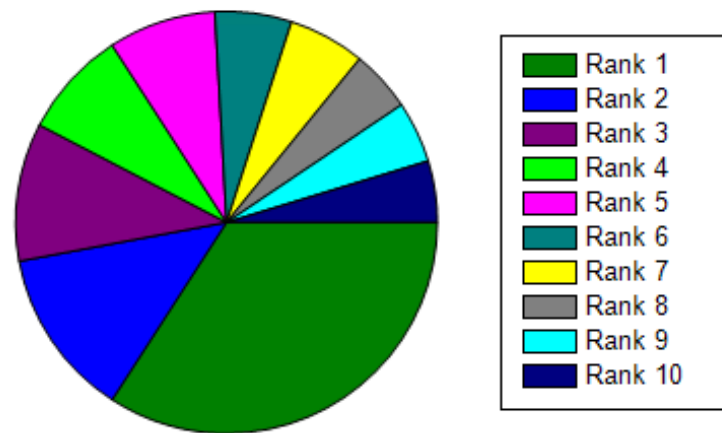


Rank	Top components	Sessions
1	OutboundRouting	261



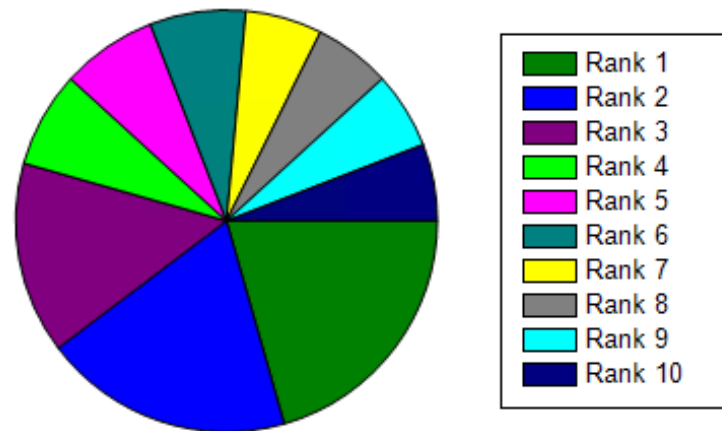
# Trend analysis

Session Distribution by Top From Users



Rank	Top from users	Sessions
1	User29787@contoso.com	29
2	User52957@contoso.com	11
3	User28818@contoso.com	9
4	User26655@contoso.com	7
5	User96454@contoso.com	7
6	User29999@contoso.com	5
7	User89049@contoso.com	5
8	User13189@contoso.com	4
9	User43399@contoso.com	4
10	User43916@contoso.com	4

Session Distribution by Top To Users



Rank	Top to users	Sessions
1	+Phone512438@contoso.com	14
2	+Phone434716@contoso.com	13
3	+Phone1592899@contoso.com	10
4	+Phone290927@contoso.com	5
5	+Phone449376@contoso.com	5
6	+Phone89885@contoso.com	5
7	+Phone135413@contoso.com	4
8	+Phone1376585@contoso.com	4
9	+Phone532616@contoso.com	4
10	+Phone950132@contoso.com	4

# Diagnostic logs

From: 2/3/2013

To: 2/4/2013

Activity type: Peer-to-Peer

Modality: Audio





Session category: [All]

User URI prefix: User29787

1 of 1

100%

Find | Next



[Dashboard](#)

[Reports](#)

[Help](#)





## User Activity Report

From: 2/3/2013 12:00:00 AM

To: 2/4/2013 12:00:00 AM

Total:

4 peer-to-peer sessions

	Detail	From user	To user	Modalities	Invite time	Response time	End time	Diagnostic ID
	<a href="#">Detail</a>	+142570000000043689	+9197100000000131206	Audio	2/3/2013 7:29:51 PM	2/3/2013 7:30:20 PM	2/3/2013 7:43:04 PM	10027
	<a href="#">Detail</a>	User29787@contoso.com	+9198100000000131205	Audio	2/3/2013 7:28:13 PM	2/3/2013 7:28:30 PM	2/3/2013 7:29:46 PM	51004
	<a href="#">Detail</a>	+142570000000043689	+6128200000000107113	Audio	2/3/2013 12:42:09 PM	2/3/2013 12:42:29 PM	2/3/2013 1:03:46 PM	10027
	<a href="#">Detail</a>	User29787@contoso.com	+Phone434716@contoso.com	Audio	2/3/2013 12:41:36 PM	2/3/2013 12:41:56 PM	2/3/2013 12:41:56 PM	12000

# Diagnostic logs

## Peer-to-Peer Session Detail Report

### Session Information

<b>Pool FQDN:</b>	pool1.contoso.com	<b>Front end:</b>	FrontEnd3.contoso.com
<b>Invite time:</b>	2/3/2013 12:41:36 PM	<b>Capture time:</b>	2/3/2013 12:41:36 PM
<b>Response time:</b>	2/3/2013 12:41:56 PM	<b>End time:</b>	2/3/2013 12:41:56 PM
<b>From user:</b>	User29787@contoso.com	<b>To user:</b>	+Phone434716@contoso.com
<b>From user agent:</b>	UCCAPI/4.0.7577.4103 OC/4.0.7577.4109 (Microsoft Lync 2010)	<b>To user agent:</b>	OutboundRouting/5.0.0.0
<b>From edge server:</b>	Edge1.contoso.com	<b>To edge server:</b>	
<b>Is From user internal</b>	No	<b>Is To user internal:</b>	Yes
<b>Is From user integrated with desk phone:</b>	No	<b>Is To user integrated with desk phone:</b>	No
<b>Session Priority</b>	Normal	<b>Is retried session:</b>	No
<b>Response code:</b>	503	<b>Diagnostic ID:</b>	12000

### Modalities

Audio

### Media Quality Report

### Diagnostic Reports

	Detail	Report time	Request	Response	Diagnostic ID	Content type	Reported by
●	Detail	2/3/2013 12:41:36 PM	INVITE	503	12000	multipart/alternative	Server
●	Detail	2/3/2013 12:42:20 PM	INVITE	503	12000	multipart/alternative	Client

# Custom SQL reporting services reports

## Gateways With The Most Poor Streams

From: Aug 15, 2013

To: Aug 16, 2013

Gateway	Location	Streams			Dur <= 30 s		Dur 31 - 60 s		Dur 61 - 90 s		Dur 91 - 120 s		Dur 121+ s	
		All	Poor	Poor %	Streams	Poor %	Streams	Poor %	Streams	Poor %	Streams	Poor %	Streams	Poor %
Gateway2	New York	14,254	541	3.8 %	6,043	0.2 %	1,716	1.6 %	570	3.0 %	276	6.5 %	5,649	8.3 %
Gateway1	Redmond	2,656	524	19.7 %	1,256	1.3 %	124	8.1 %	46	28.3 %	12	41.7 %	1,218	39.4 %
Gateway3	London	9,417	303	3.2 %	3,865	0.2 %	1,064	1.5 %	382	2.9 %	192	4.2 %	3,914	6.6 %
Gateway4	Brazil	522	164	31.4 %	166	20.5 %	90	37.8 %	38	39.5 %	20	30 %	208	36.1 %
Gateway5	Atlanta	468	142	30.3 %	168	20.8 %	62	30.6 %	40	32.5 %	30	46.7 %	168	36.3 %
Gateway6	Las Vegas	76	14	18.4 %	46	17.4 %	14	14.3 %	2	50 %	2	50 %	12	16.7 %
Gateway10	Spokane	698	7	1.0 %	316	0 %	46	0 %	46	0 %	14	0 %	276	2.5 %
Gateway25	Moscow	574	7	1.2 %	330	0 %	96	0 %	22	0 %	4	0 %	122	5.7 %

# Summary

There is a large amount of data gathered during monitoring. It's critical that you understand how to read the data and reports so that you maintain high quality communications for the end user.

# Microsoft IT best practices



Microsoft IT best practices  
Additional resources

# Microsoft IT best practices

What	Establish parameters for call quality and service availability
Why	Maintain reliability and predictability of collaboration services
How	Collect QoE and CDR data Monitor frequently Maintain visibility of stats



# Additional resources

Find CQM and the SfB/Lync Network Guide here:

<http://blogs.office.com/2014/07/01/call-quality-methodology-scorecard-for-lync-server/>

Find Call Quality Dashboard (CQD) here:

<http://www.microsoft.com/en-us/download/details.aspx?id=46916>



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