VOIP in XKEYSCORE

March 2009

Derived From: NSA/CSSM 1-52
Dated: 20070108
Declassify On: 20291123

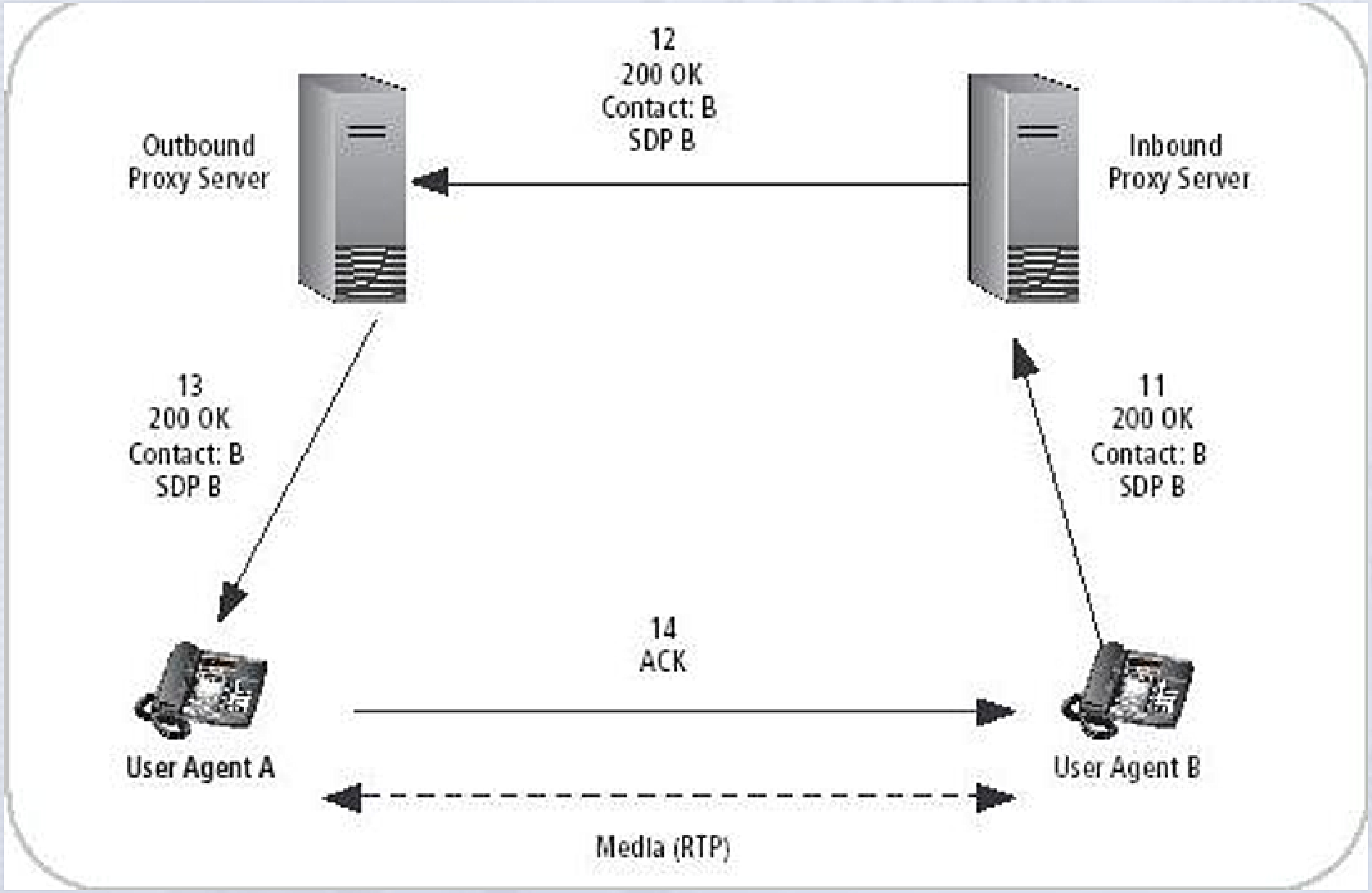
DERIVED FROM: NSA/CSSM 1-52

Protocols

- Signaling/setup/control
  - SIP (Session Initiation Protocol)
  - H323
  - Skinny
  - Clarent
  - Yahoo proprietary
- Data - voice, fax, video
  - RTP (Real-time Transport Protocol)

The Problem

- Setup and data may take different routes
- Different routes may be collected at different sites
- Routes may change



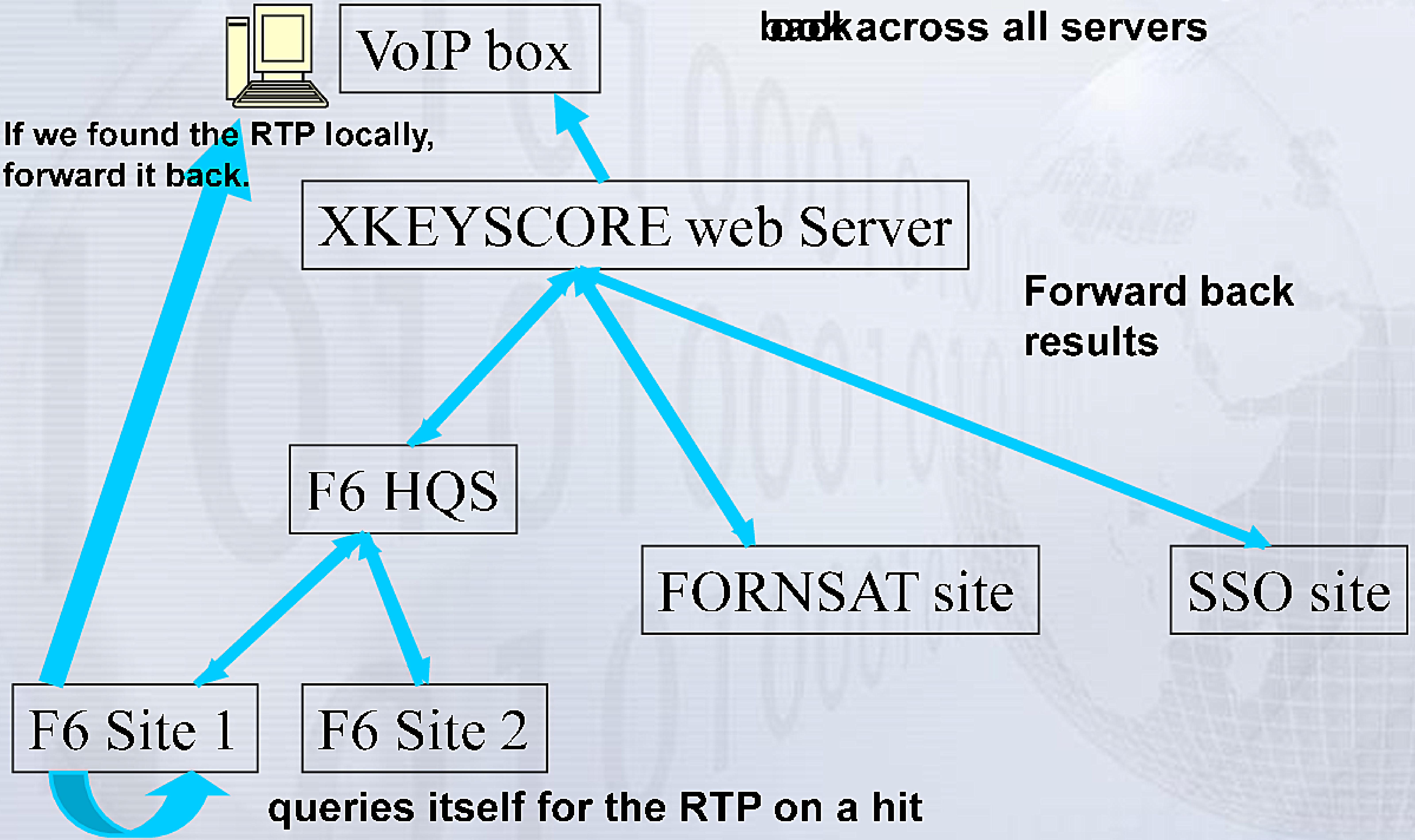
XKS Solution

1. Local site XKS identifies VOIP setup involving a tasked target
2. Local XKS queries itself for corresponding RTP data
3. If the local query fails, it is passed back to HQS for a cross-site query across the entire XKS network
4. Forward hits to NUCLEON and generate summary reports

XKS Solution

If we didn't find the RTP locally, ask across all servers

If we find the RTP, forward it back



If we found the RTP locally, forward it back.

Forward back results

queries itself for the RTP on a hit

VOIP Hits

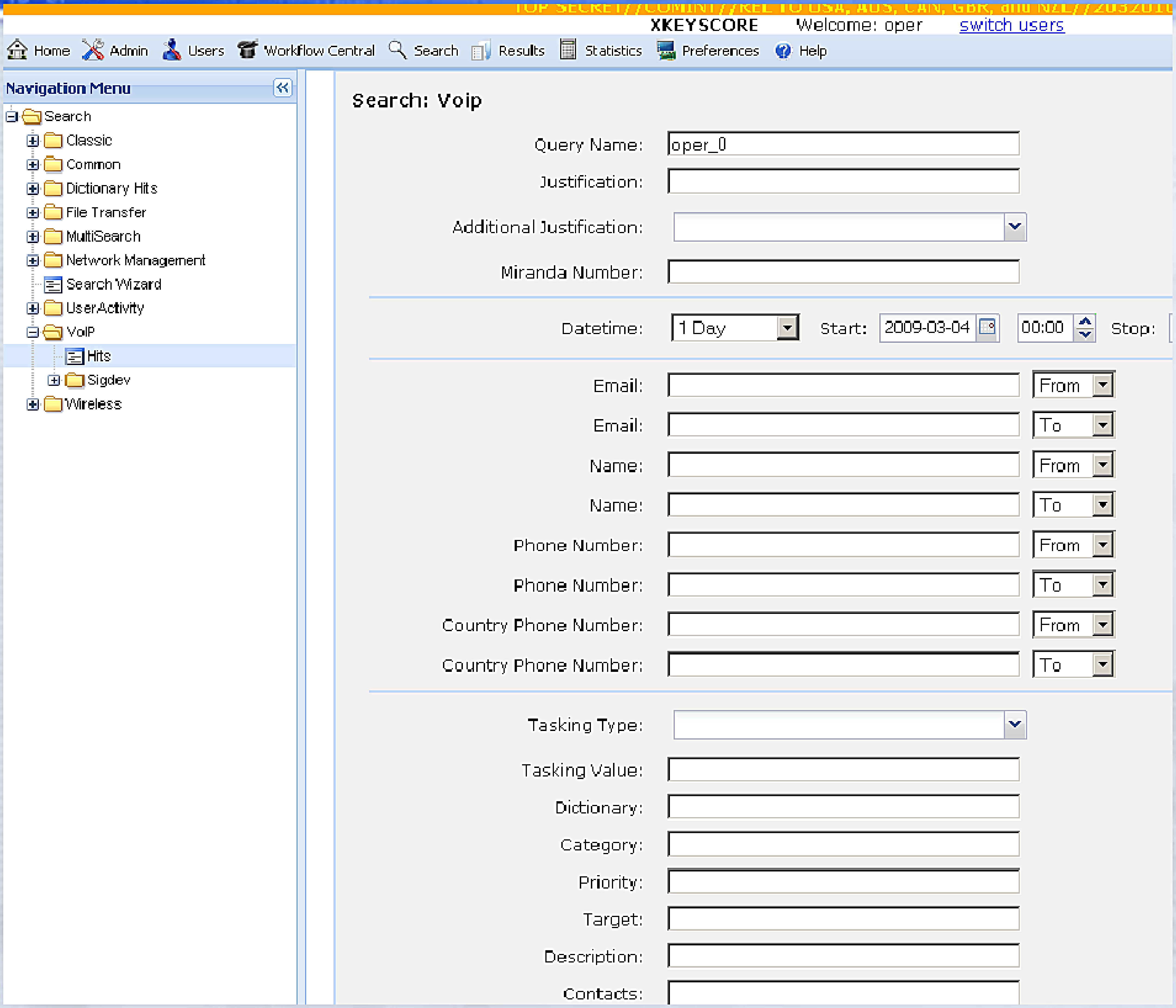
Use this to find data for which…

- There was a dictionary hit on the VOIP signaling (TRAFFICTHIEF, CADENCE, OCTAVE, MARINA, UTT)

… AND …

- We were able to find the RTP corresponding to the signaling information

VOIP Hits



Search: Voip

Query Name: oper_0

Justification:

Additional Justification:

Miranda Number:

Datetime: 1 Day Start: 2009-03-04 00:00 Stop:

Email: From

Email: To

Name: From

Name: To

Phone Number: From

Phone Number: To

Country Phone Number: From

Country Phone Number: To

Tasking Type:

Tasking Value:

Dictionary:

Category:

Priority:

Target:

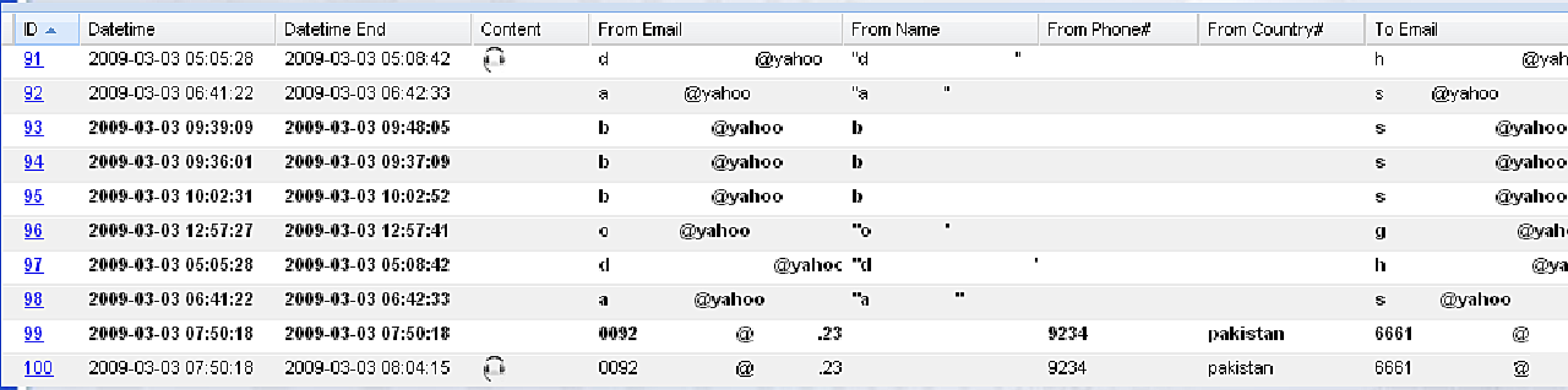
Description:

Contacts:

VOIP Hits - Search Form

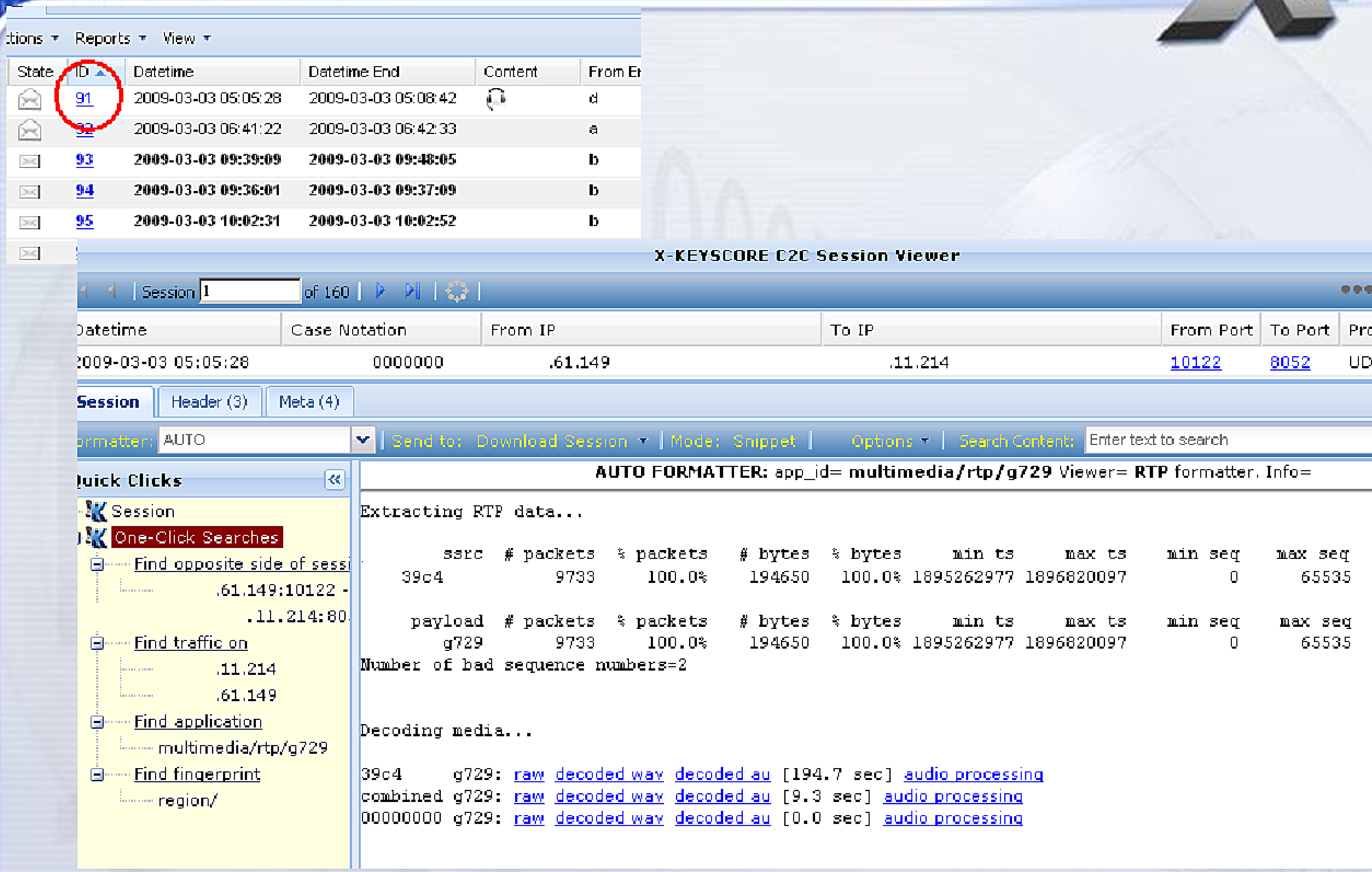
- User/target information
  - Email
  - Name
  - Phone number
  - IP address
  - Country code
- Content information
  - Content type (audio, video, image)
  - Control type (SIP, H323, skinny, clarent)
  - Fingerprints - may indicate specific VOIP devices

VOIP Hits - Results



ID ▲	Datetime	Datetime End	Content	From Email	From Name	From Phone#	From Country#	To Email
91	2009-03-03 05:05:28	2009-03-03 05:08:42	🎧	d @yahoo	"d "			h @yah
92	2009-03-03 06:41:22	2009-03-03 06:42:33		a @yahoo	"a "			s @yahoo
93	**2009-03-03 09:39:09**	**2009-03-03 09:48:05**		**b @yahoo**	**b**			**s @yahoo**
94	**2009-03-03 09:36:01**	**2009-03-03 09:37:09**		**b @yahoo**	**b**			**s @yahoo**
95	**2009-03-03 10:02:31**	**2009-03-03 10:02:52**		**b @yahoo**	**b**			**s @yahoo**
96	**2009-03-03 12:57:27**	**2009-03-03 12:57:41**		**o @yahoo**	**"o '**			**g @yah**
97	**2009-03-03 05:05:28**	**2009-03-03 05:08:42**		**d @yahoc**	**"d '**			**h @ya**
98	**2009-03-03 06:41:22**	**2009-03-03 06:42:33**		**a @yahoo**	**"a "**			**s @yahoo**
99	**2009-03-03 07:50:18**	**2009-03-03 07:50:18**		**0092 @ .23**		**9234**	**pakistan**	**6661 @**
100	2009-03-03 07:50:18	2009-03-03 08:04:15	🎧	0092 @ .23		9234	pakistan	6661 @

VOIP Hits - RTP Viewer



State	ID ▲	Datetime	Datetime End	Content	From E
✉	91	2009-03-03 05:05:28	2009-03-03 05:08:42	🎧	d
✉	92	2009-03-03 06:41:22	2009-03-03 06:42:33		a
✉	**93**	**2009-03-03 09:39:09**	**2009-03-03 09:48:05**		**b**
✉	**94**	**2009-03-03 09:36:01**	**2009-03-03 09:37:09**		**b**
✉	**95**	**2009-03-03 10:02:31**	**2009-03-03 10:02:52**		**b**
✉					

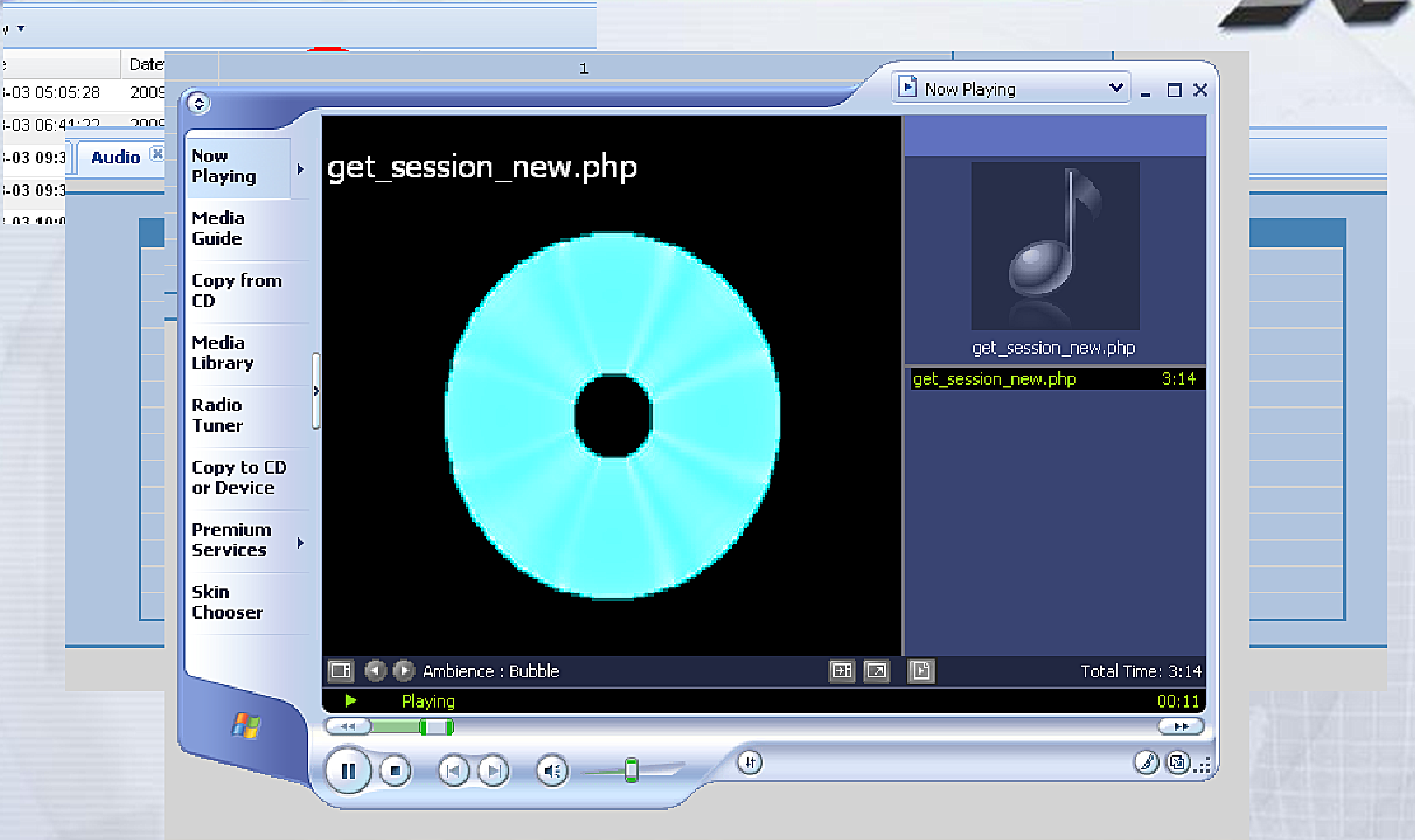
X-KEYSCORE C2C Session Viewer

Datetime	Case Notation	From IP	To IP	From Port	To Port	Pro
2009-03-03 05:05:28	0000000	.61.149	.11.214	10122	8052	UD

AUTO FORMATTER: app_id= **multimedia/rtp/g729** Viewer= **RTP formatter**. Info=

```
Extracting RTP data...

        ssrc  # packets  % packets   # bytes   % bytes     min ts     max ts    min seq    max seq
    39c4           9733     100.0%    194650    100.0% 1895262977 1896820097          0      65535

     payload  # packets  % packets   # bytes   % bytes     min ts     max ts    min seq    max seq
        g729       9733     100.0%    194650    100.0% 1895262977 1896820097          0      65535
Number of bad sequence numbers=2


Decoding media...

39c4      g729: raw decoded wav decoded au [194.7 sec] audio processing
combined g729: raw decoded wav decoded au [9.3 sec] audio processing
00000000 g729: raw decoded wav decoded au [0.0 sec] audio processing
```

VOIP Hits - audio



get_session_new.php 3:14

Ambience : Bubble

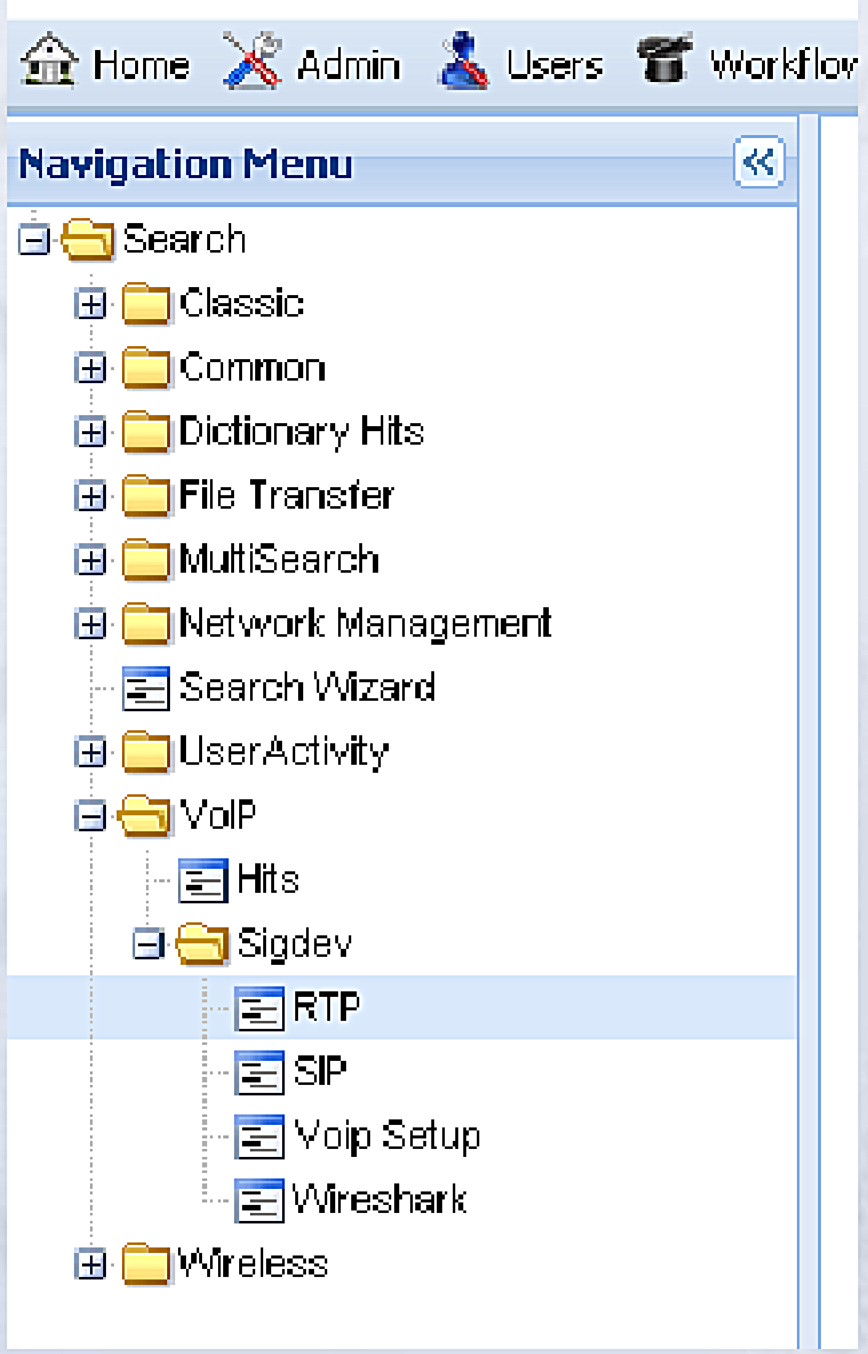
Total Time: 3:14

Playing 00:11

VOIP Sigdev

Use these search forms to find other VOIP not included in the VOIP Hits

- RTP
- SIP
- VOIP Setup
- Wireshark



Questions?

- Contact the team:
  - xkeyscore@nsa.ic.gov
  - http://xkeyscore.[redacted] (go xkeyscore)
- Primary POCs for VOIP:
  - [redacted]@nsa.ic.gov
  - [redacted]@nsa.ic.gov