



(U//FOUO) AURORAGOLD Working Group

**(S//SI//REL) Shaping understanding of
the global GSM/UMTS/LTE landscape**

SIGDEV Conference – 6 June 2012

This briefing is classified:
TOP SECRET//SI//REL TO FVEY

Derived From: NSA/CSSM 1-52
Dated: 20070108
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Agenda



(U)

- (U//FOUO) What is AURORAGOLD?
- (U) Why come to us?
- (U) Our value proposition...
 - (S//SI//REL) Primary source mobile network information
 - (S//SI//REL) First-hand insight into industry changes
- (U//FOUO) Targeting efforts
- (U) Notable successes
- (U) Future plans
- (U) Discussion!



What is AURORAGOLD?



(U//FOUO)

(U) Team of analysts, developers, and wireless SMEs working on:

- (S//SI//REL) Database of Mobile Network Operators (MNOs), networks, and PWIDs from collected GSM/UMTS/LTE roaming documents (IR.21s)
- (S//SI//REL) Target development effort against MNOs, roaming hubs, and working groups
- (U) Fusion of open source, commercial data with SIGINT to answer wireless needs



Why come to us?



(U)

- (S//SI//REL) Extensive, global IR.21 data vetted by SSG4 analysts:
 - **701 networks of estimated 985** (as of 15 May 2012)
 - First-hand SIGINT information direct from MNOs
- (S//SI//REL) Most comprehensive set of IR.21-related email selectors and keyword-based tasking:
 - **1201 actively managed email selectors** (as of 15 May 2012)
- (U//FOUO) Foundation for worldwide mobile wireless network trending and forecasting
 - Includes visibility into changing industry standards and practices



How can we help you?



(U)

(S//SI//REL) Example: "AFRICOM IKD-OPS requires information concerning the SMS Gateway domains for: Libyana mobile (libyana.ly) and Al Madar Al Jadid (almadar.ly). We believe these are the only two mobile providers in Libya but if you have information to the contrary please let us know."

3 March 2011





We've done the research



(U)

- (S//SI//REL) Quickly identified collected IR.21s
- (U//FOUO) Pushed information out to customer through product reporting

DOCN 000028528
ZNY ZNY MMIVX
ZKZK ZKZK RR SOL DE
PDTG R 162037Z MAR 11
FM FM DIRNSA
CLAS T O P S E C R E T UMBRA US/UK/CAN/AUS/NZ EYES ONLY QQQQ
XXMM XXMMENP01FOO11075

SERI SERIAL: 3/00/506998-11

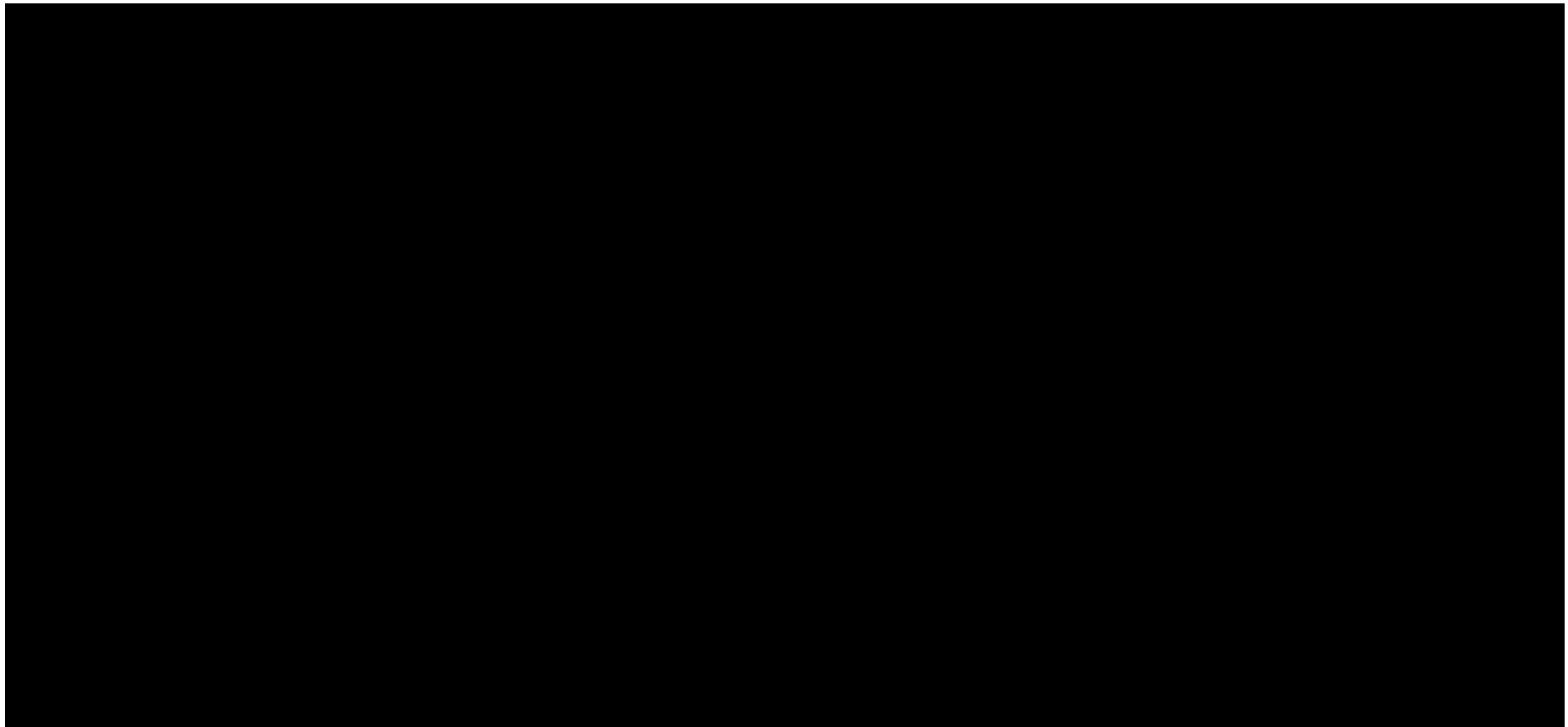
TAGS TAGS: LIC CCOM CLOG COEF CORG CPER CTEC CTPH LI

SUBJ SUBJ: Libya/Telecommunications: Two Libyan Mobile Phone Companies
Provide Updated Network Information, June and December 2010
(S//SI//REL TO USA, FVEY)



SIGINT Value – Al Madar IR.21

(S//SI//REL)



Extracted from 3/00/506998-11



SIGINT Value – Al Madar IR.21

(S//SI//REL)



Vendor Information	
BSS vendor(s) and SW/HW version:	Ericsson
HLR vendor(s) and SW/HW version:	Ericsson
MSC/VLR vendor(s) and SW/HW version:	Ericsson
SMSC vendor(s) and SW/HW version:	Alcatel-Lucent V 3.1
SGSN vendor(s) and SW/HW version:	Ericsson R7
GGSN vendor(s) and SW/HW version:	Ericsson R4
MMSC vendor(s) and SW/HW version:	Ericsson MMC 5.0
IN vendor(s) and SW/HW version:	Alcatel-Lucent

SMSC Information	
SMSC GT addresses ⁹ :	[REDACTED]
	[REDACTED]
	[REDACTED]
	[REDACTED]
	[REDACTED]
	[REDACTED]
	[REDACTED]
	[REDACTED]
	[REDACTED]
	[REDACTED]

GPRS Information	
APN Operator Identifier	[REDACTED]
List of APN	[REDACTED]
APN	[REDACTED]
Username	[REDACTED]
Password	[REDACTED]
ISP DNS IP address (primary)	[REDACTED]
ISP DNS IP address (secondary)	[REDACTED]
APN	[REDACTED]
Username	[REDACTED]
Password	[REDACTED]
WAP Gateway IP address	[REDACTED]
WAP Server URL	[REDACTED]
Port	[REDACTED]
APN	[REDACTED]
Username	[REDACTED]
Password	[REDACTED]
WAP Gateway IP address for MMS	[REDACTED]
Messaging Server URL	[REDACTED]
Port	[REDACTED]
GTP version	[REDACTED]
SGSN	[REDACTED]
GGSN	[REDACTED]
BSS information (optional field)	[REDACTED]
Contact person(s) for GPRS (optional field)	[REDACTED]

MMS Interworking Information	
Domain name of MMSC	[REDACTED]
IP address range for MMSC	[REDACTED]
IP address(es) of incoming MTA	[REDACTED]
IP address(es) of outgoing MTA	[REDACTED]
Max. size of MMS allowed	[REDACTED]
Delivery Report allowed?	[REDACTED]
Read Report allowed?	[REDACTED]
Contact person(s) for IW MMS: (optional field)	[REDACTED]
MMS IW Hub Provider(s) GT addresses:	[REDACTED]
MMS IW Hub Provider(s) Name(s):	[REDACTED]

Extracted from 3/00/506998-11



IR.21s in AURORAGOLD

(S//SI//REL)



1.8.3 ROAMING DATA BASE

Operator name	AL MADAR AL JADID
Technology	GSM 900 /1800
Country (Abbreviated according to ISO 3166)	Libya LBV

ROUTING INFORMATION		
CCITTE.164 Number series:	Country Code (CC)	National Destination Code (NDC)
MSISDN Number range(s):	218	91
Network nodes Global Title number range(s):	218	91
E.212 Number series:	Mobile Country Code (MCC)	Mobile Network Code (MNC)
	606	01
E.214 Mobile Global Title: (MGT)	Country Code of MGT (CC)	Network Code of MGT (NC)
	218	91
Does Number Portability apply ¹ ?		No

International Roaming Coordinator:

Eng. [REDACTED]
 IR Coordinator
 T: [REDACTED]
 Fax: [REDACTED]
 Email: [REDACTED]@almadar.ly

Eng. [REDACTED]
 IR Coordinator
 T: [REDACTED]
 Fax: [REDACTED]
 Email: [REDACTED]@almadar.ly

Eng. [REDACTED]
 IR Coordinator
 T: [REDACTED]
 Fax: [REDACTED]
 Email: [REDACTED]@almadar.ly

Eng. [REDACTED]
 IR Coordinator
 T: [REDACTED]
 Fax: [REDACTED]
 Email: [REDACTED]@almadar.ly

Extracted from 3/00/506998-11



We monitor the industry



(S//SI//REL)

- (S//SI//REL) Visibility into changing standards and practices for:
 - Roaming
 - Signaling
 - Billing
 - Interoperability
- GSM Association (GSMA), a Swiss association that drives the GSM/UMTS/LTE space



Roaming Agreement EXchange (RAEX)



(S//SI//REL)

- (U) Next-generation roaming exchange process
- (U) Well-defined XML schemas instead of semi-structured data in multiple formats
- (U) Email likely gives way to SSL sessions with central server(s)

(S//SI//REL)	SIGINT Access	SIGINT Value	Automated Analytics
Old IR.21s	Easy	Great	Nearly impossible
RAEX IR.21s	Difficult	Even greater!	Easy!



Targeting Efforts



(U//FOUO)

- (S//SI//REL) MNO roaming coordinators, hubs, GSMA working groups, ROAMSYS
- (S//SI//REL) ~100% of MNOs in WPMO's Top 20

Category	Contains...
4002	IR21 senders/receivers
3918	GSMA and SIGDEV



Tag	Contains...
AGIR21	IR21 senders/receivers
AG_USER	Individual (usually sender)
AG_ALIAS	Alias (usually receiver)
MCC/MNC [###][###]	IR21 s/r for given network
AGRAEX	RAEX working groups
roaming hub	Roaming hub contacts



Email Address Selectors

(S//SI//REL)



Filter Criteria

Org: Team: Batch Taskable: All

Designator: Zipcode: Place Name:

Category: Tag: MCC/MNC Realm: All Selector:

Target Type: All Targeting Nationality: IR Target Name:

Targeting Location: IR Target Shareable Name:

Targeting Status: Tasked Create Date >= Create Date <=

Selector Information Task Create New TR

Display: 25 Page 1 of 1 Total Records: 6

Select All Clear All	Normalized Selector	Target Shareable Name	Interest	Targeting Interest	Targeting Status	
☐	:emailAddr>					Task
☐	:emailAddr>					Task
☐	:emailAddr>					Task
☐	:emailAddr>					Task
☐	:emailAddr>					Task
☐	:emailAddr>					Task

UTT v3.2 SP1 - Task Selector Search

Dynamic Page -- Highest Possible Classification is TOP SECRET//COMINT//REL TO USA, AUS, CAN, GBR, NZL



Notable Successes



(U)

- (TS//SI//REL) Characterization of IR.21 collection from 67 high-priority networks (DSD)
- (TS//SI//REL) Most recent IR.21s from Egypt (S2E)
- (S//SI//REL) Assessment of IR.21 collection related to a possible new Chinese network (S2B)
- (S//REL) Sole source of IR.21 collection, ingest, and processing for RONIN; >200% improvement (NAC)
- (S//SI//REL) Working toward enterprise sharing of licensed, commercial data
 - Today: WiMAX data with JUBILEECORONA (S3516)
- (TS//SI//REL) Reporting on GSMA standards and practices



Future Plans



(U)

- (S//SI//REL) RAEX IR.21 collection and ingest providing more query possibilities including:
 - LTE information
 - Technologies/Equipment
 - Frequencies
- (S//SI//REL) AURORAGOLD user interface enabling SIGINT production chain access for querying and trending
- (S//SI//REL) NKB partnership



Discussion



(U)

- (S//SI//REL) What are your ideas, suggestions, and analytic needs with respect to:
 - roaming and network information discovery and development?
 - GSMA's standards setting activities?
- (S//SI//REL) What are we missing? Are there data elements we should seek out to help meet your needs?



Work with us!



(U)

- (U//FOUO) To contact the AURORAGOLD team with an RFI, please use GLOBAL TIPPER

[“go GT”](#)



- (U//FOUO) WikiInfo: [“wi AURORAGOLD”](#)
- (U//FOUO) Email: 

(U//FOUO) AURORAGOLD

(U) BACKUP SLIDES



AG/GSMA Reporting



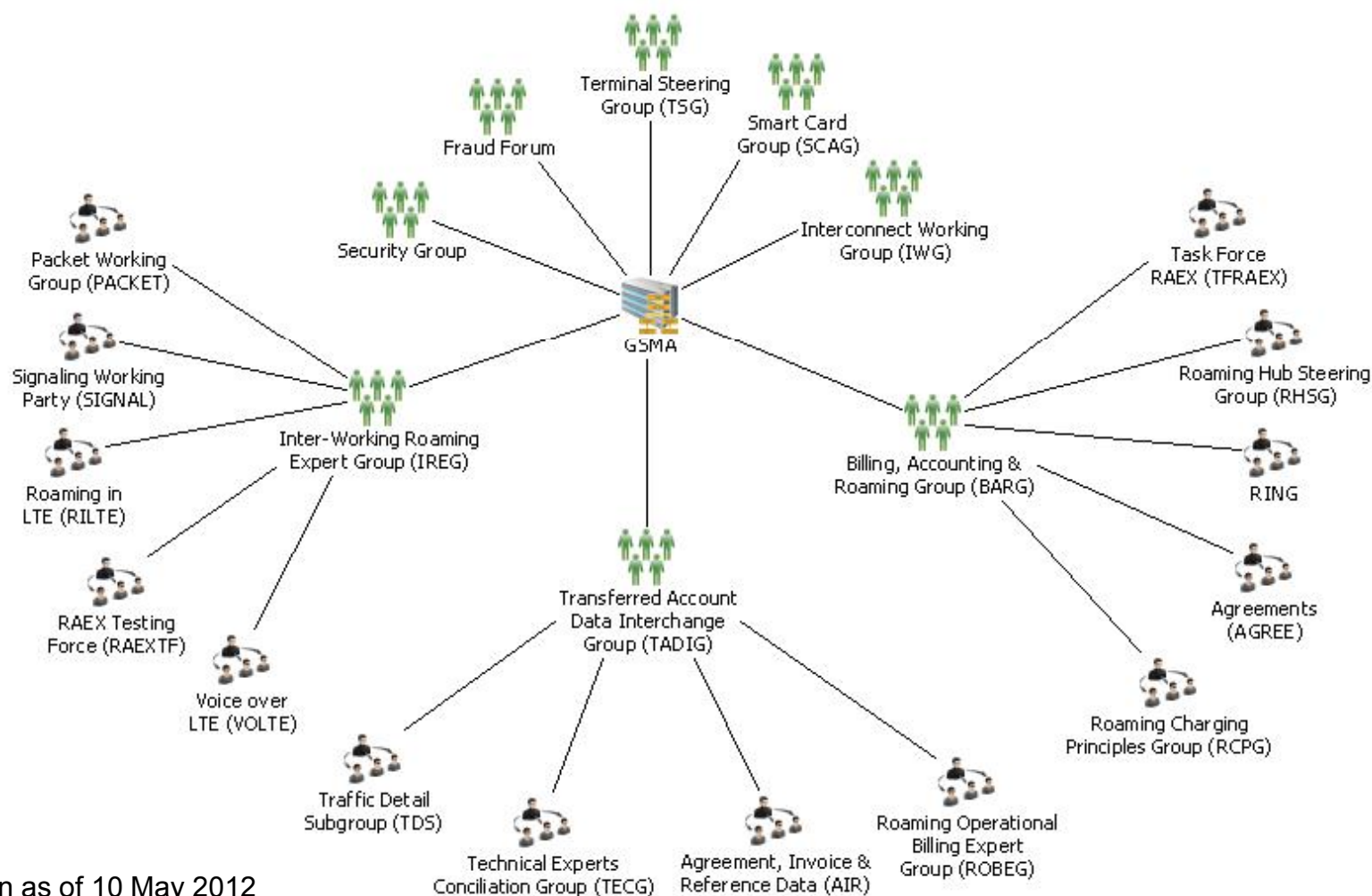
(S//SI//REL)

Serial	Topic
3/00/506998-11	(S//SI//REL) Libyan MNO information
3/00/556211-11	(S//SI//REL) Launch of RAEX; ROAMSYS and GSMA
3/00/515656-12	(S//SI//REL) GSMA standards releases/changes for 2012 (RAEX IR.21 and others)
2/00/502330-12	(S//SI//REL) GSMA database of Type Allocation Codes (TACs)



GSMA Working Groups

(S//SI//REL)



(U) Known as of 10 May 2012



IR.21 Data Extraction



(S//SI//REL)

(U) Content

Field	AG	R
MCC/MNC	x	x
Operator name	x	x
Operator country	x	x
Email addresses	x	
Access point information		x
Autonomous system number		x
DNS names & IPs		x
Inter PLMN backbone IPs		x
GPRS Roaming Exchange (GRX)		x

(U) Metadata/SRI

Field	AG	R
SIGAD	x	x
Case notation	x	x
PWID	x	x
PINWALE Date Time Group	x	x
PINWALE category & keywords	x	
Email "From" & date	x	
Source & destination IP	x	
Filename	x	
PDDG		x

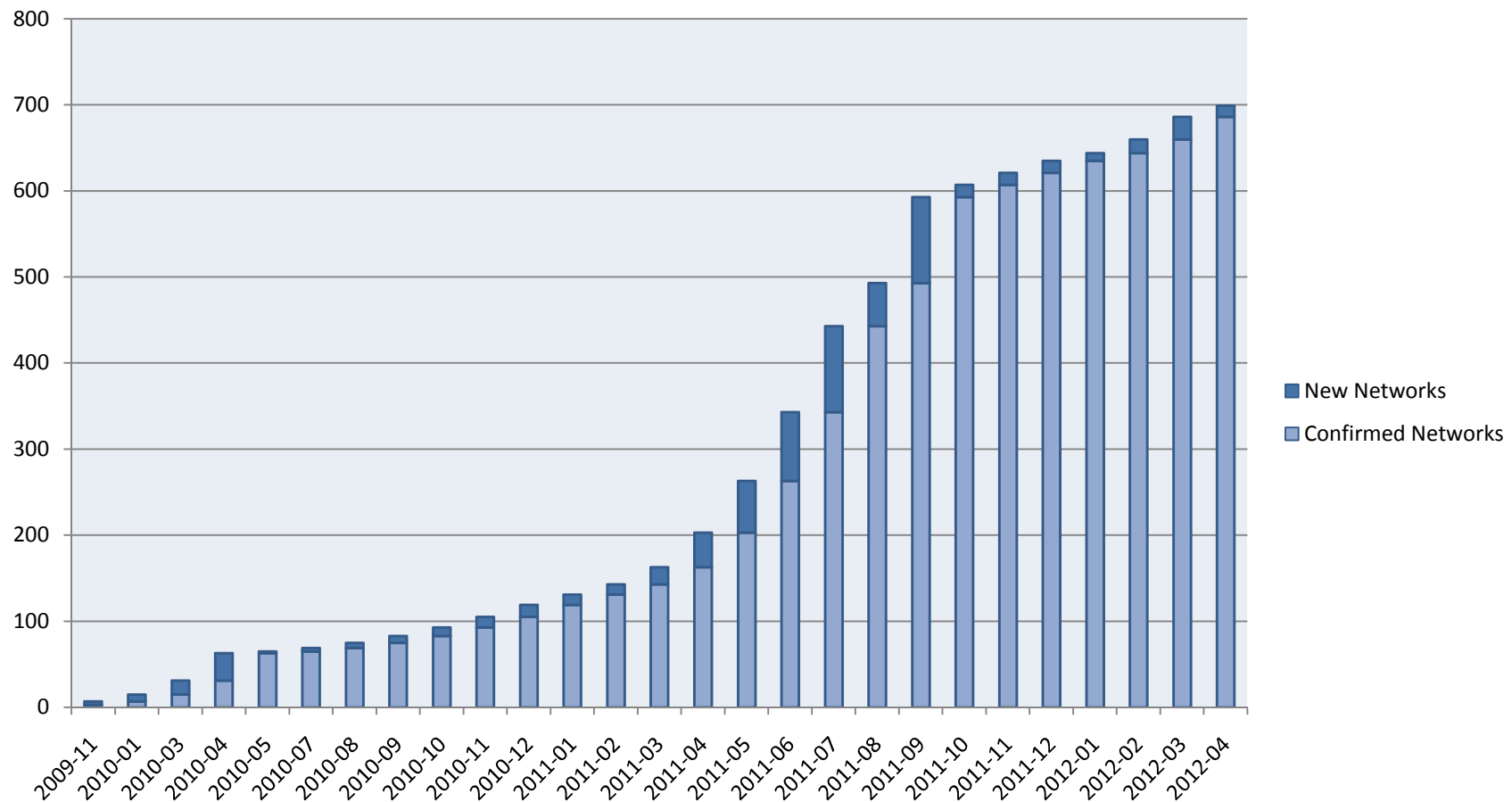


Metrics: Network Discovery

(S//SI//REL)



(S//SI//REL) GSM/UMTS/LTE Networks Discovered in SIGINT



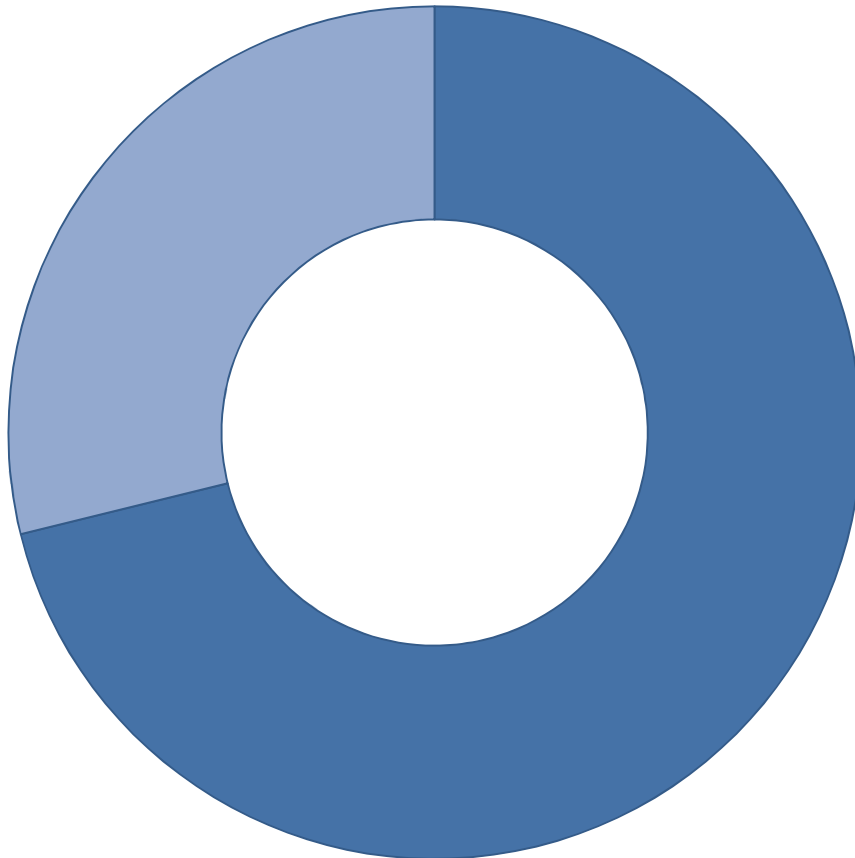


Metrics: Network Discovery



(S//SI//REL)

(S//SI//REL) GSM/UMTS/LTE Network
Coverage



- (S//SI//REL)
 - 701 confirmed
 - 985 estimated
 - 71%

(as of 15 May 2012)



Network Coverage

(S//SI//REL)



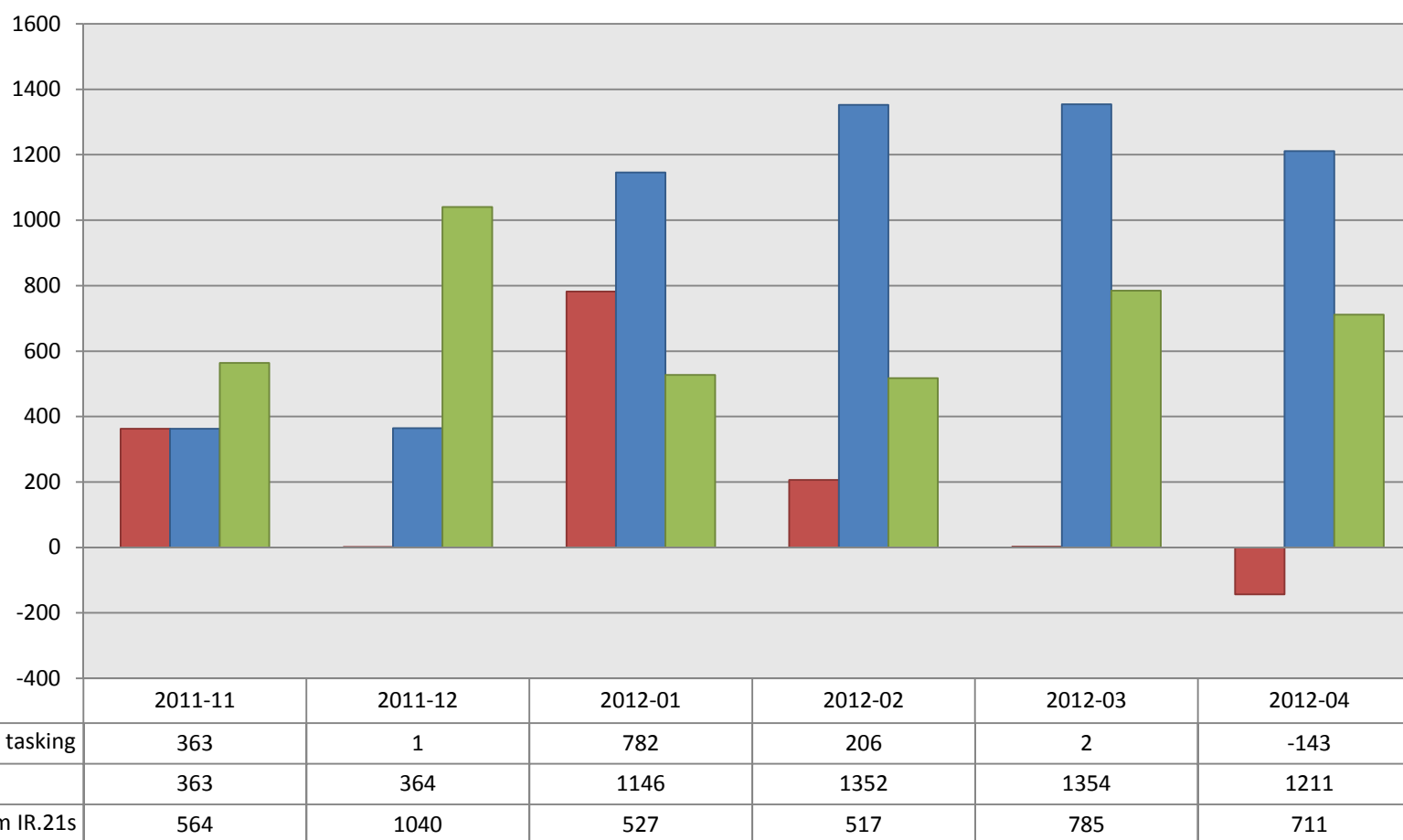


Metrics: Tasking



(S//SI//REL)

(S//SI//REL) Strong Selector Targeting



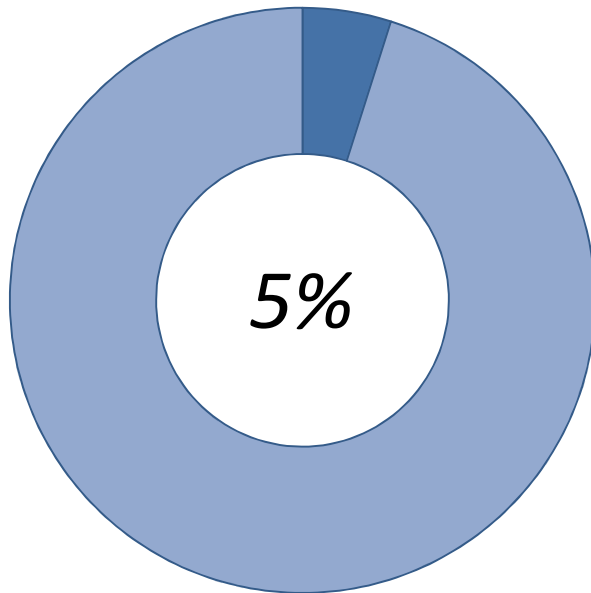


RAEX Adoption in SIGINT



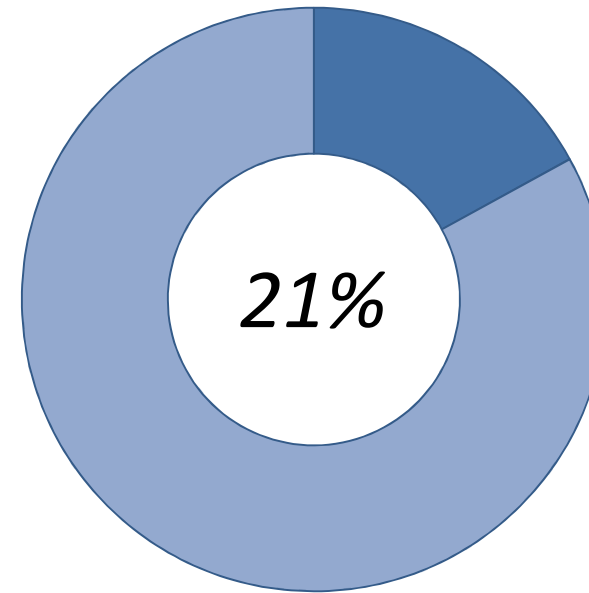
(S//SI//REL)

(S//SI//REL) What we've seen so far...



(S//SI//REL) 36/699 networks
(Apr 2012; AURORAGOLD)

(TS//SI//REL) What we expect...



(TS//SI//REL) 202/985 networks
(19 Apr 2012; 3/00/515656-12)