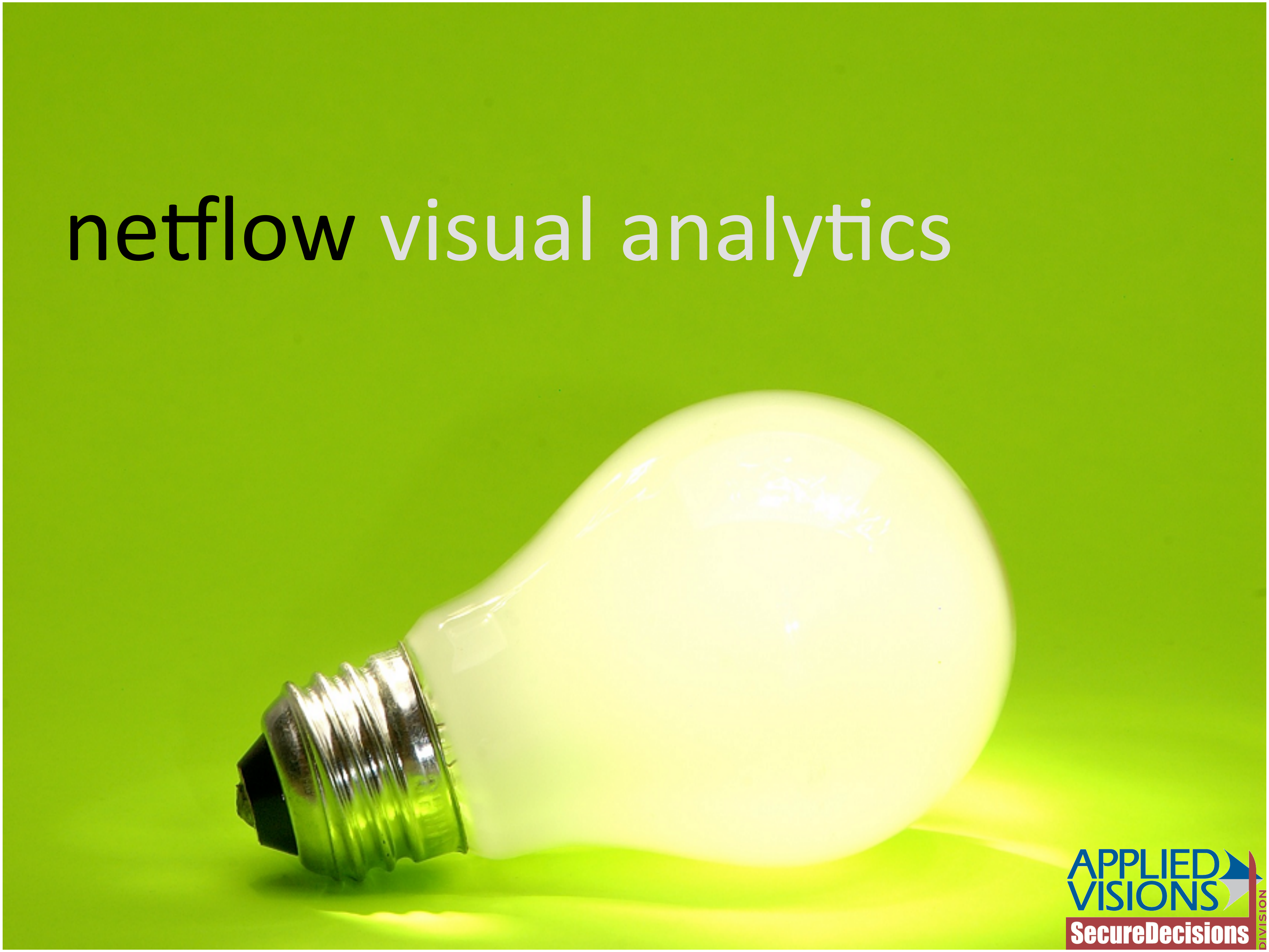
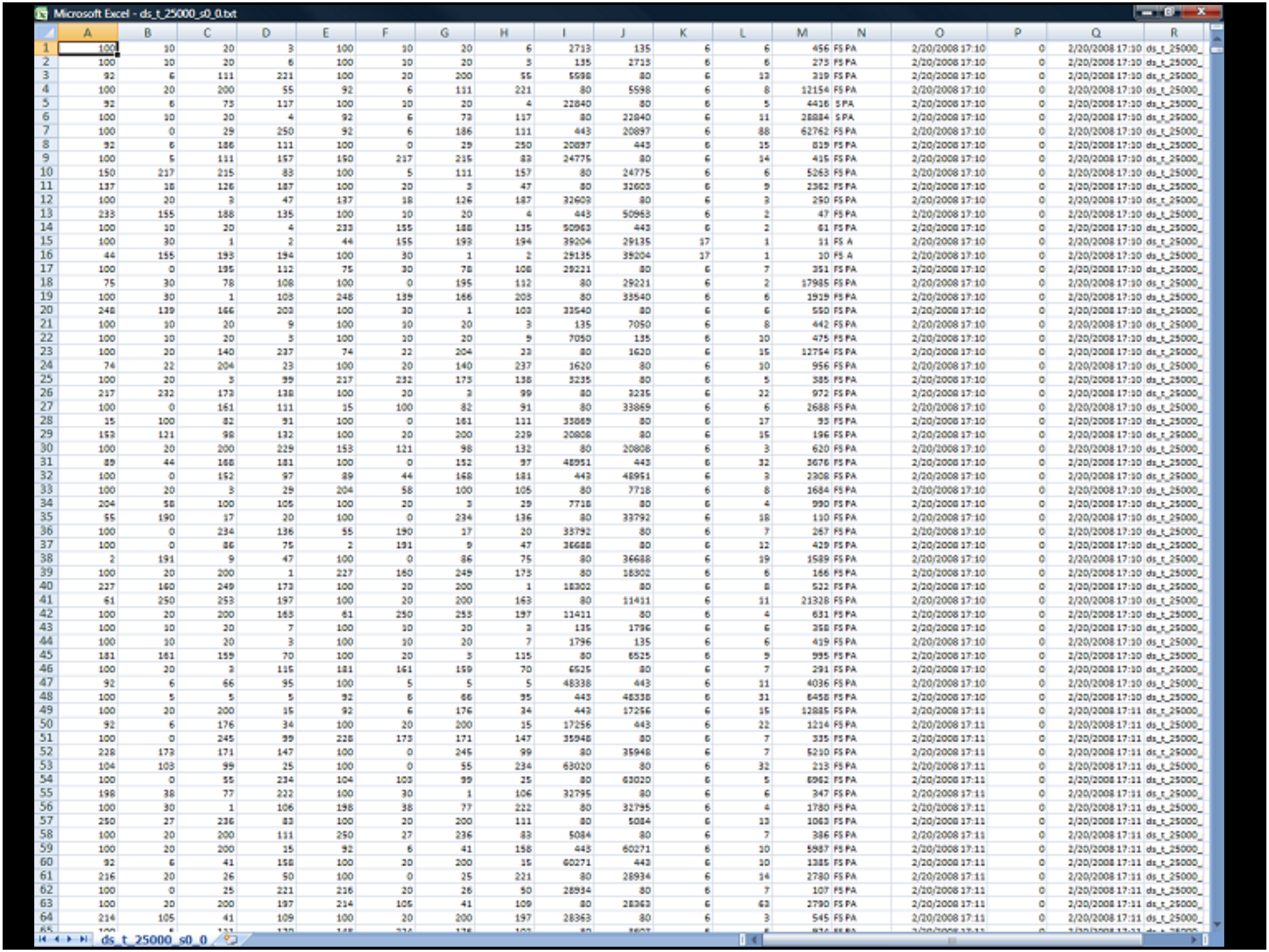
netflow visual analytics



APPLIED VISIONS
SecureDecisions
DIVISION

1,542,761,868

flows per day at US-CERT



Microsoft Excel - ds_t_25000_s0_0.txt

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	100	10	20	3	100	10	20	6	2713	135	6	6	456	FS PA	2/20/2008 17:10	0	2/20/2008 17:10	ds_t_25000_
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6	100	10	20	4	92	6	73	117	80	22840	6	11	28884	S PA	2/20/2008 17:10	0	2/20/2008 17:10	ds_t_25000_
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53	104	103	99	25	100	0	55	234	63020	80	6	32	213	FS PA	2/20/2008 17:11	0	2/20/2008 17:11	ds_t_25000_
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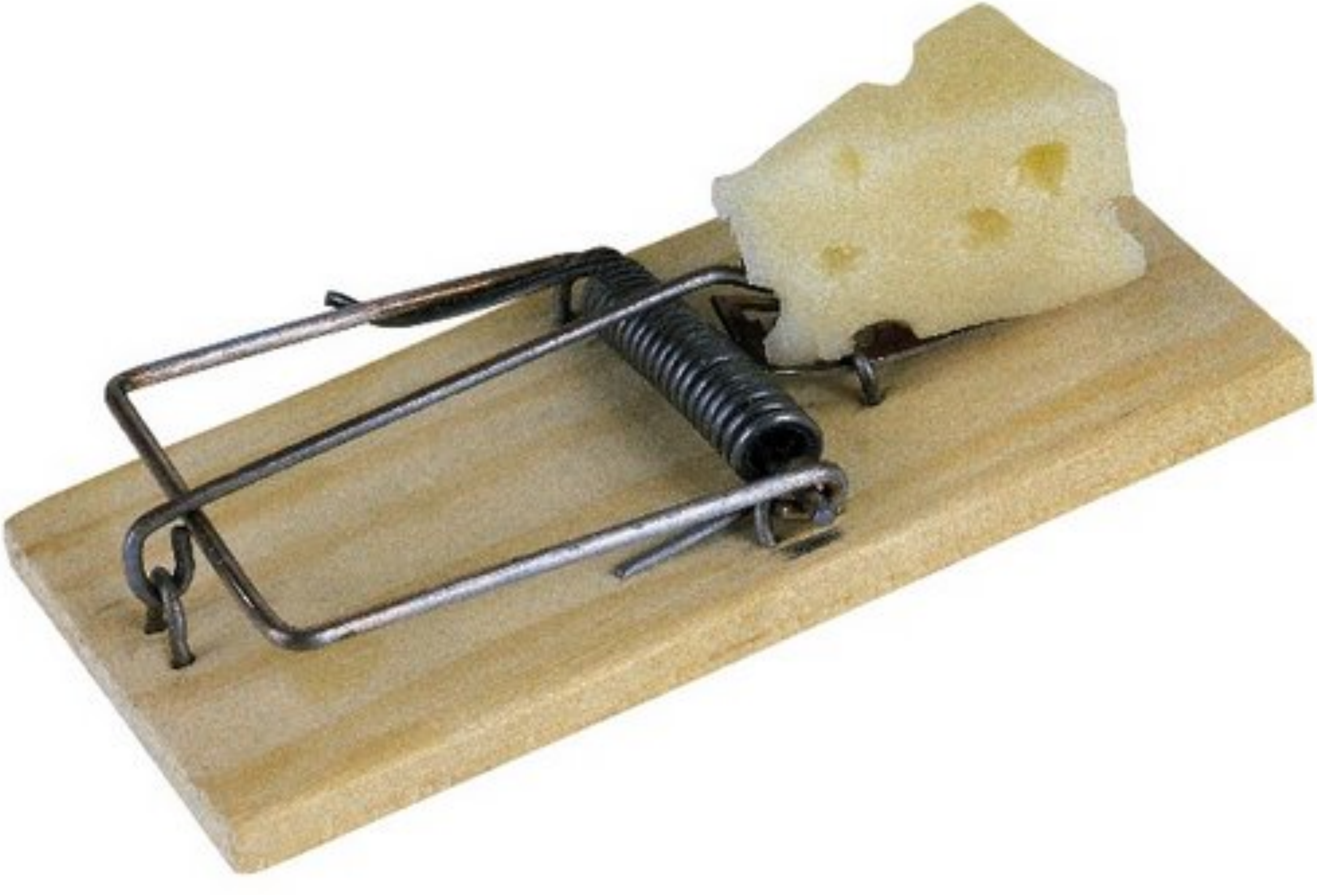
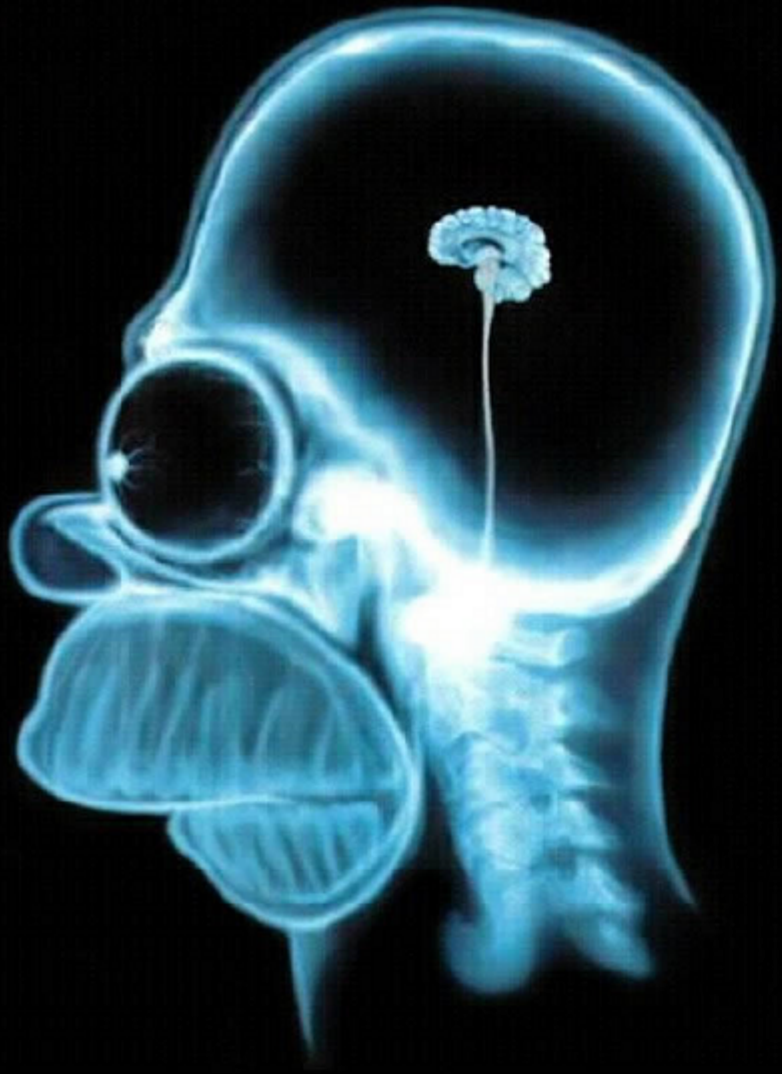
64	214	105	41	109	100	20	200	197	28363	80	6	3	545	FS PA	2/20/2008 17:11	0	2/20/2008 17:11	ds_t_25000_

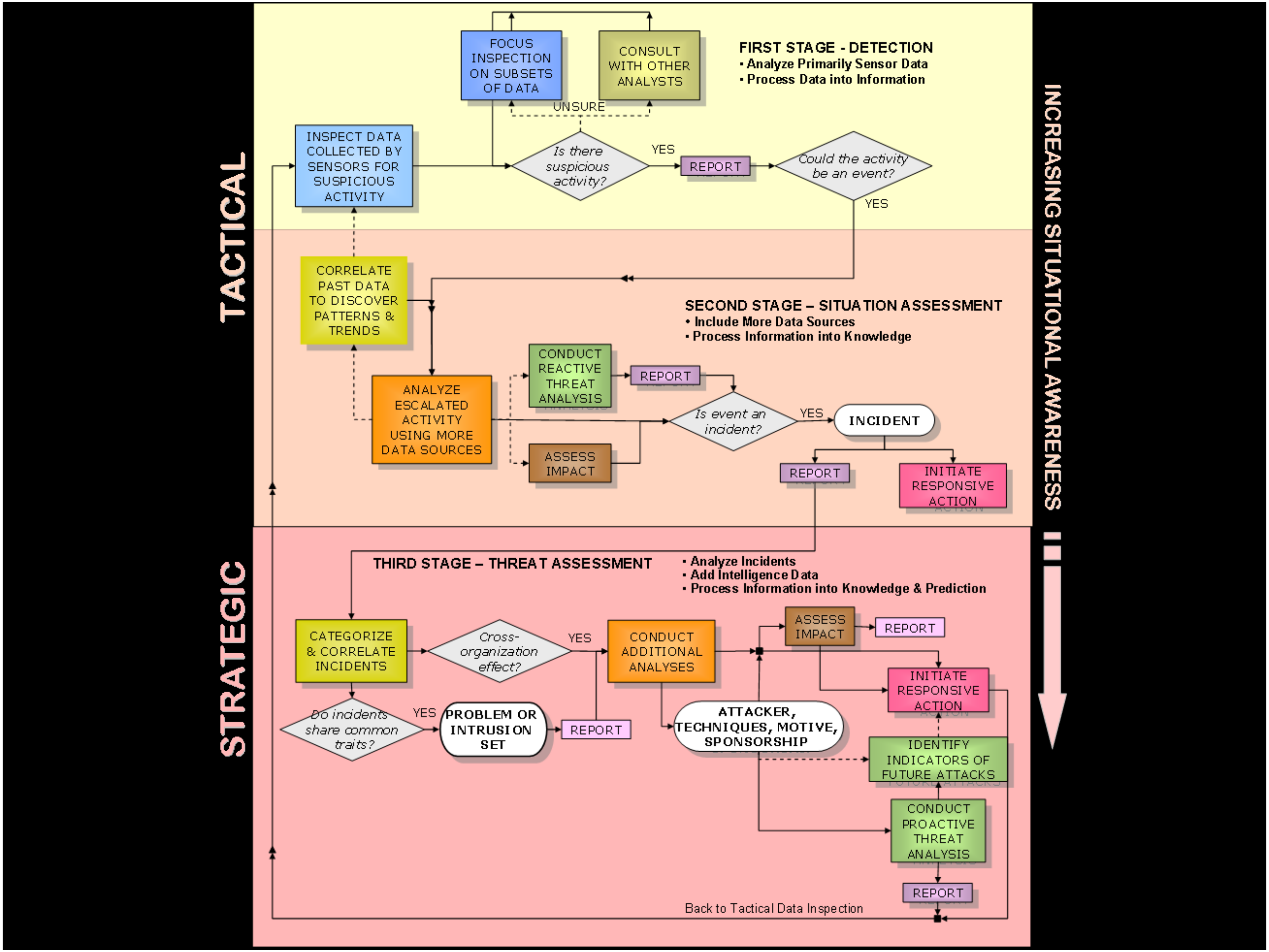
see the needle?

how can we do better?



cognitive task analysis





TACTICAL

STRATEGIC

INCREASING SITUATIONAL AWARENESS

FIRST STAGE - DETECTION

- Analyze Primarily Sensor Data
- Process Data into Information

INSPECT DATA COLLECTED BY SENSORS FOR SUSPICIOUS ACTIVITY

Is there suspicious activity?

UNSURE

FOCUS INSPECTION ON SUBSETS OF DATA

CONSULT WITH OTHER ANALYSTS

YES

REPORT

Could the activity be an event?

YES

SECOND STAGE – SITUATION ASSESSMENT

- Include More Data Sources
- Process Information into Knowledge

CORRELATE PAST DATA TO DISCOVER PATTERNS & TRENDS

ANALYZE ESCALATED ACTIVITY USING MORE DATA SOURCES

CONDUCT REACTIVE THREAT ANALYSIS

REPORT

ASSESS IMPACT

Is event an incident?

YES

INCIDENT

REPORT

INITIATE RESPONSIVE ACTION

THIRD STAGE – THREAT ASSESSMENT

- Analyze Incidents
- Add Intelligence Data
- Process Information into Knowledge & Prediction

CATEGORIZE & CORRELATE INCIDENTS

Cross-organization effect?

YES

CONDUCT ADDITIONAL ANALYSES

Do incidents share common traits?

YES

PROBLEM OR INTRUSION SET

REPORT

ASSESS IMPACT

REPORT

INITIATE RESPONSIVE ACTION

ATTACKER, TECHNIQUES, MOTIVE, SPONSORSHIP

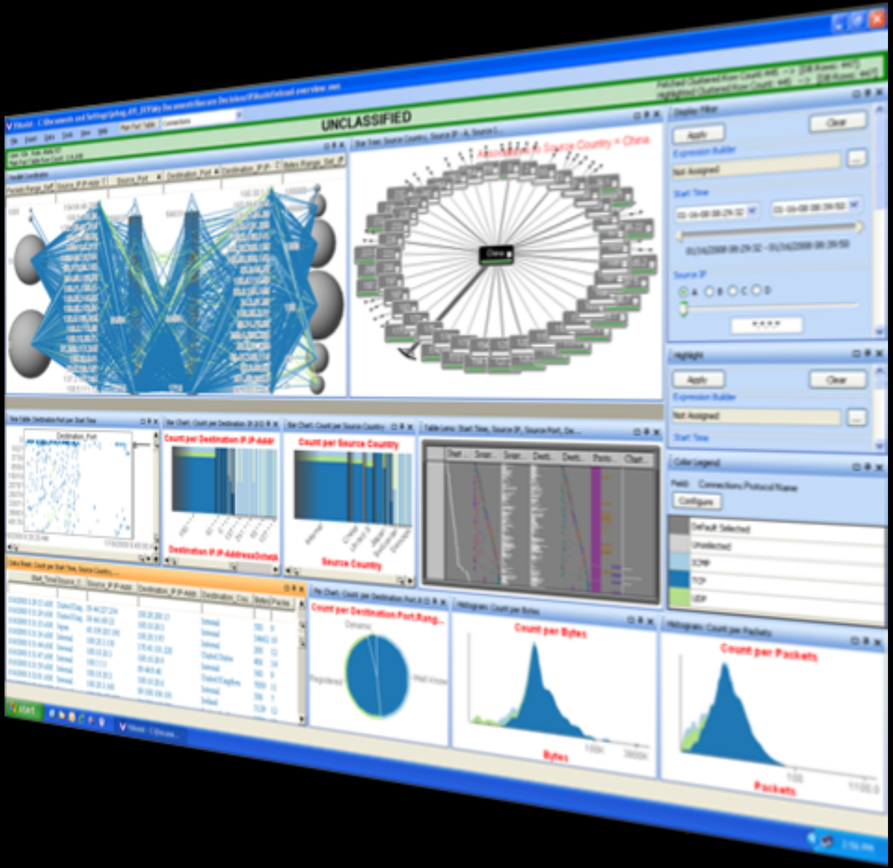
IDENTIFY INDICATORS OF FUTURE ATTACKS

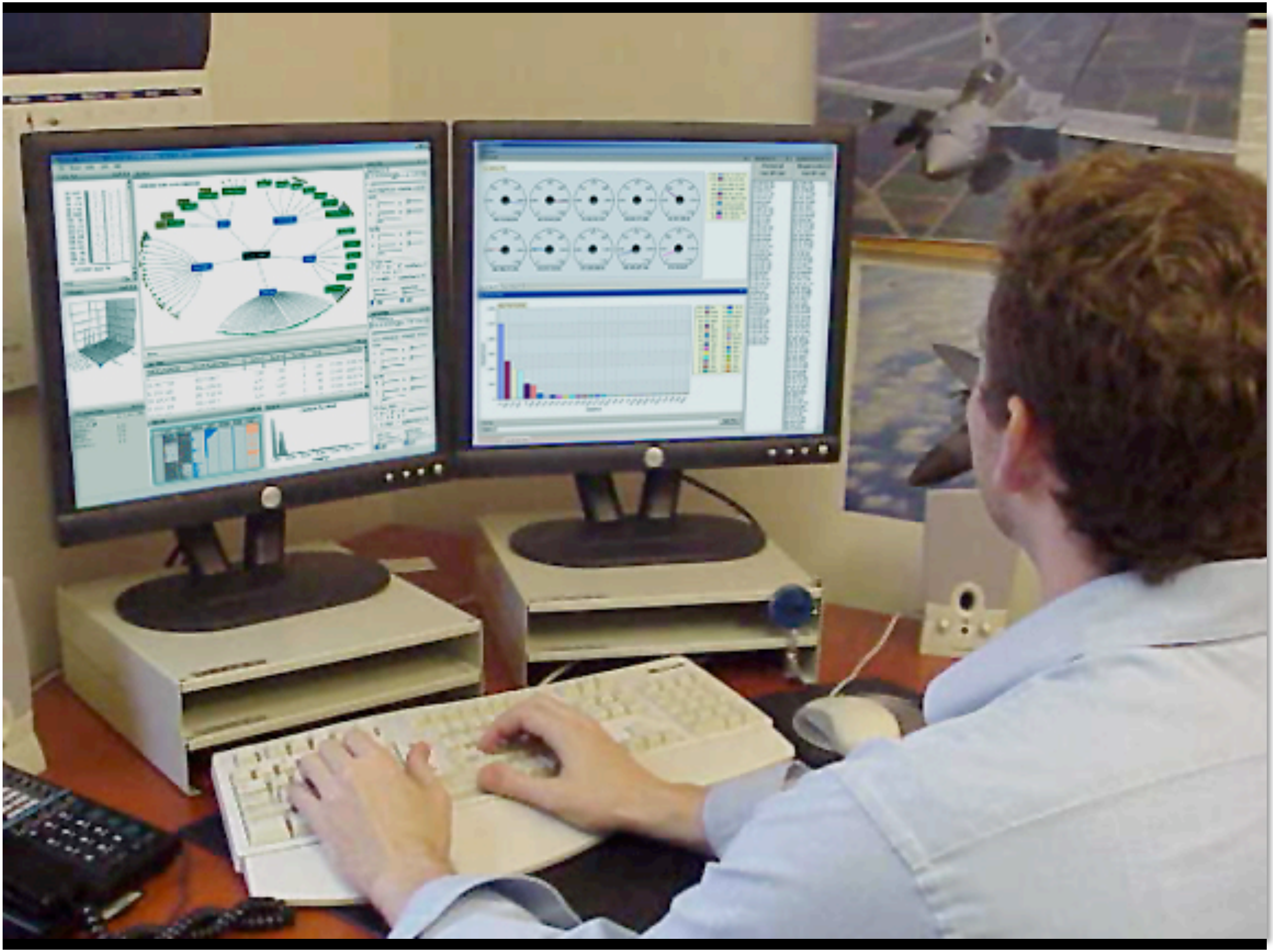
CONDUCT PROACTIVE THREAT ANALYSIS

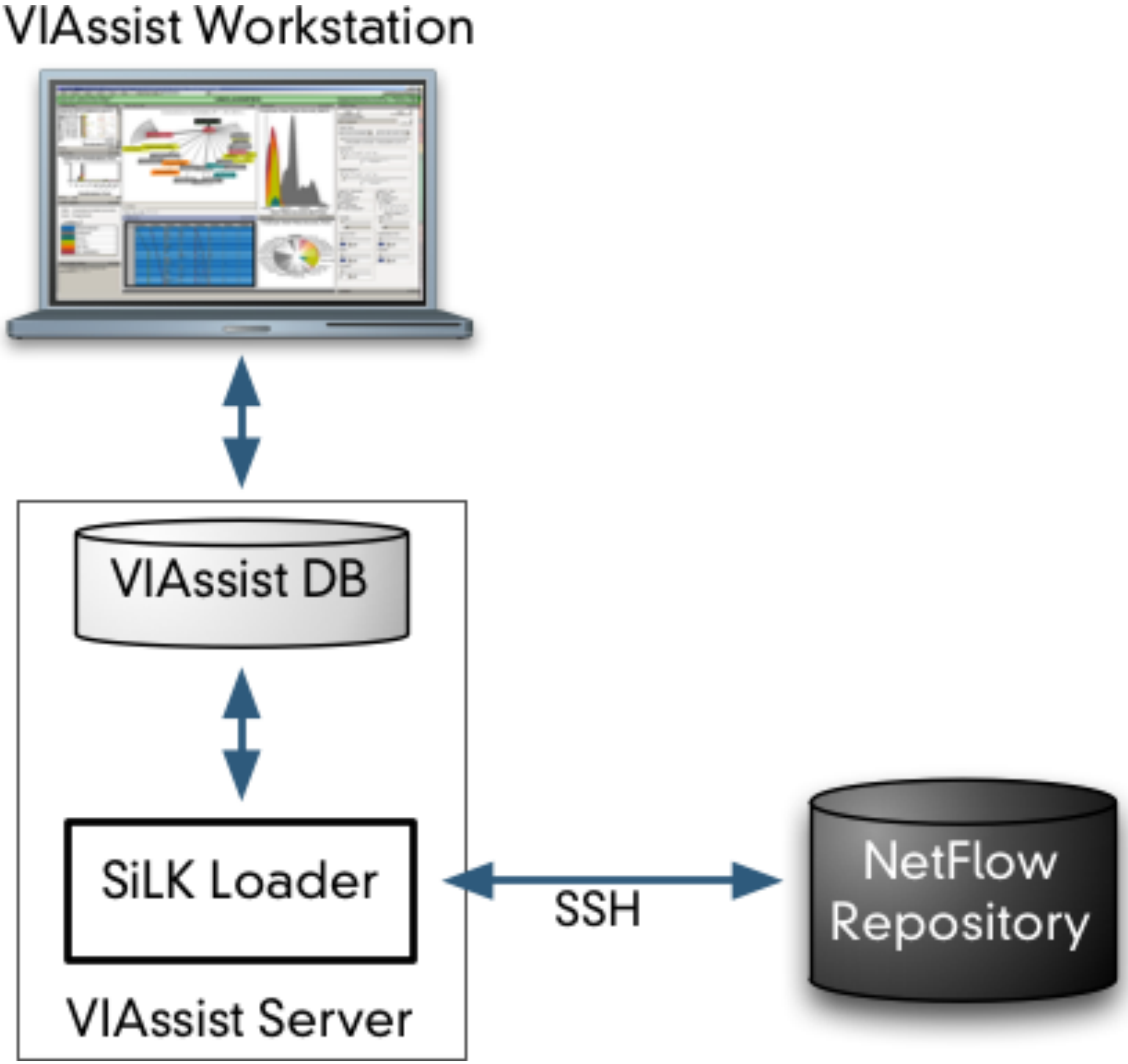
REPORT

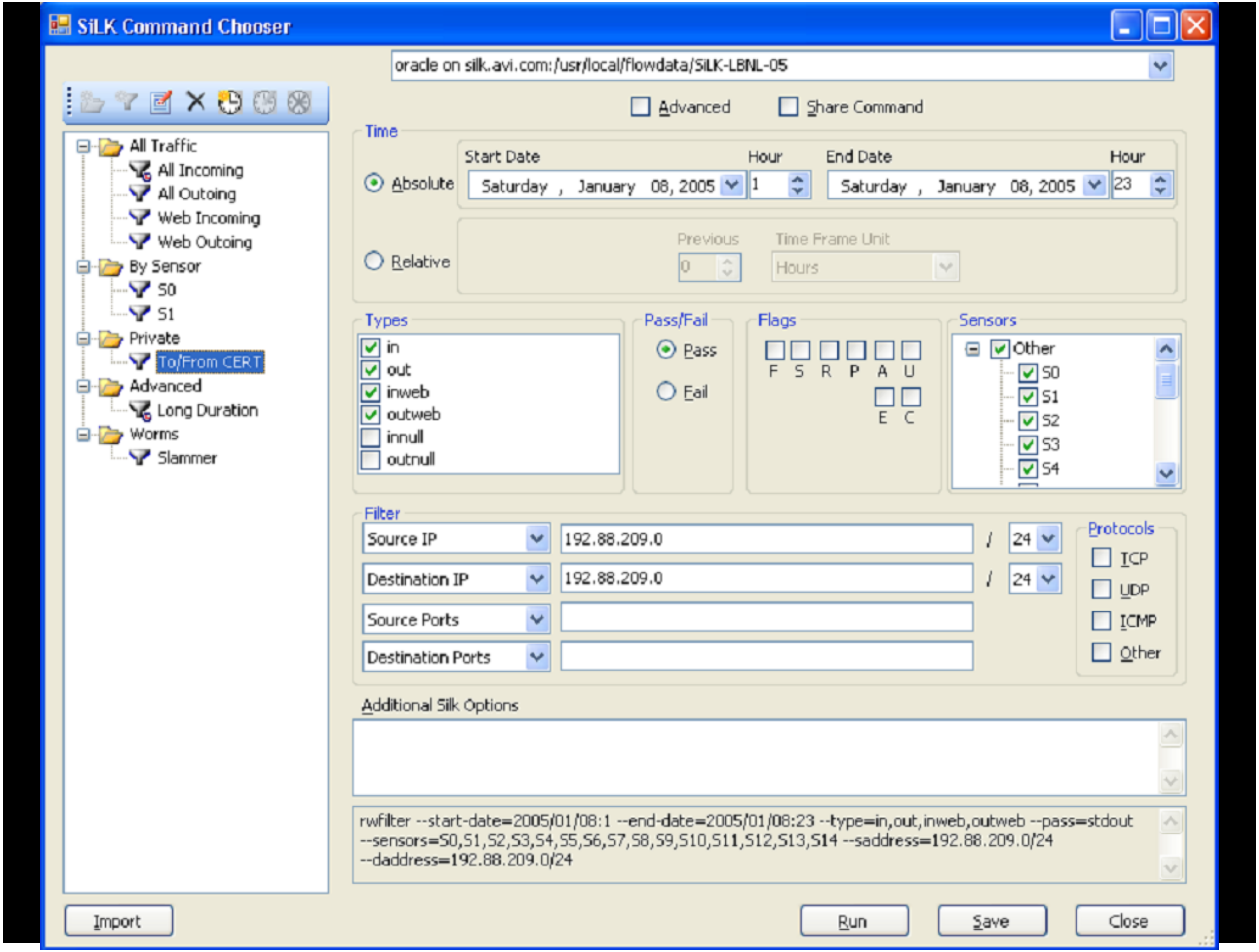
Back to Tactical Data Inspection

VIASSIST


UNCLASSIFIED
Count per Destination IP.IP-Addr
Destination IP.IP-AddressOctets
Count per Source Country
Source Country
Count per Destination Port.Rang...
Count per Bytes
Bytes
Count per Packets
Packets
Apply
Clear
Not Assigned
Start Time
Source IP
Color Legend
Configure
Default Selected
Unselected
ICMP
TCP
UDP




VIAssist Workstation
VIAssist DB
SiLK Loader
VIAssist Server
SSH
NetFlow Repository



oracle on silk.avi.com:/usr/local/flowdata/SiLK-LBNL-05

□ Advanced □ Share Command

Time

● Absolute

Start Date	Hour	End Date	Hour
Saturday , January 08, 2005	1	Saturday , January 08, 2005	23

○ Relative Previous 0 Time Frame Unit Hours

Types

☑ in
☑ out
☑ inweb
☑ outweb
□ innull
□ outnull

Pass/Fail

● Pass
○ Fail

Flags

□ F □ S □ R □ P □ A □ U □ E □ C

Sensors

☑ Other
☑ S0
☑ S1
☑ S2
☑ S3
☑ S4

Filter

Source IP	192.88.209.0	/	24
Destination IP	192.88.209.0	/	24
Source Ports			
Destination Ports			

Protocols

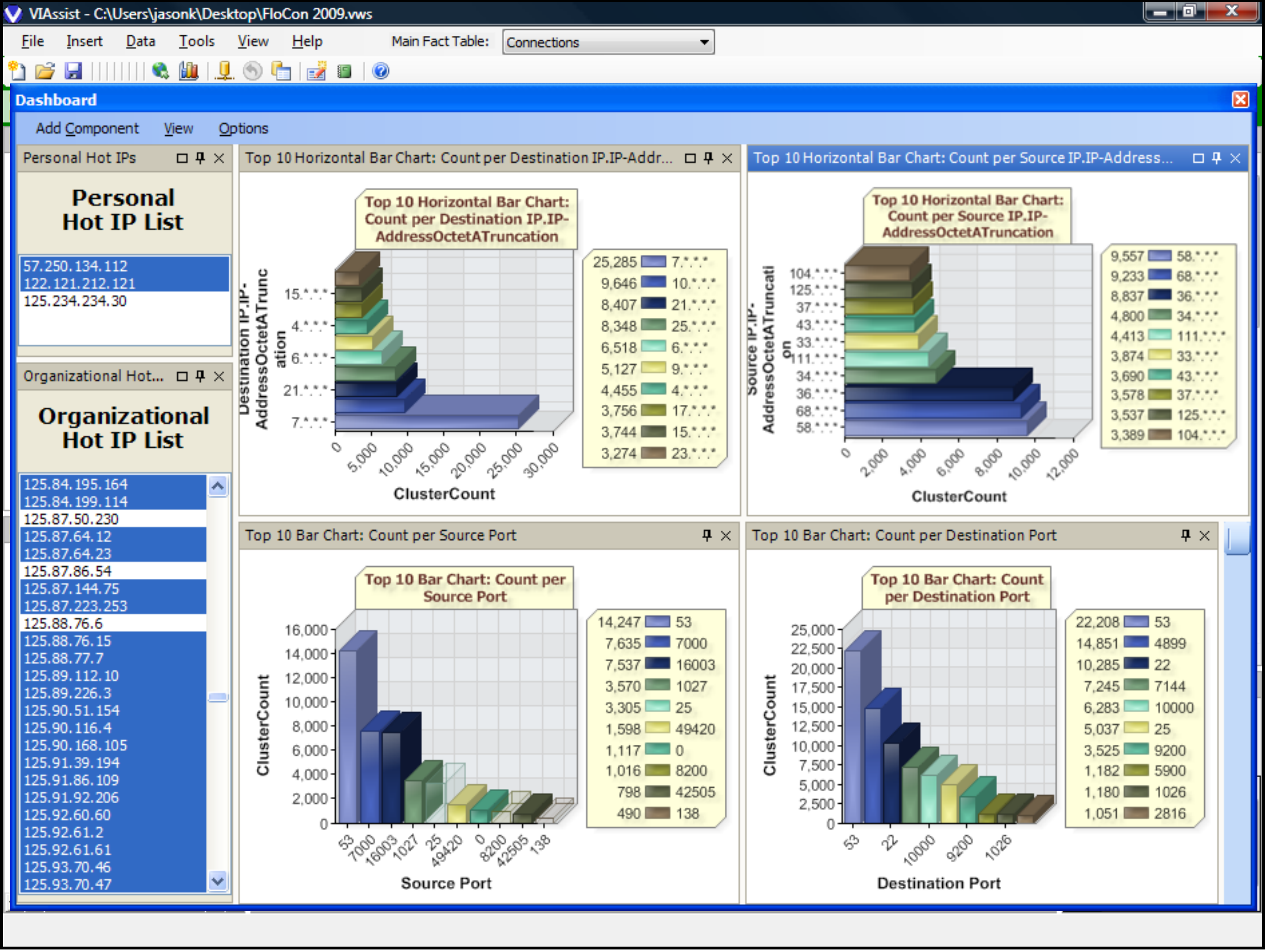
□ TCP
□ UDP
□ ICMP
□ Other

Additional Silk Options

```
rwfilter --start-date=2005/01/08:1 --end-date=2005/01/08:23 --type=in,out,inweb,outweb --pass=stdout
--sensors=S0,S1,S2,S3,S4,S5,S6,S7,S8,S9,S10,S11,S12,S13,S14 --saddress=192.88.209.0/24
--daddress=192.88.209.0/24
```

smart aggregation

2 million unfiltered flows



VIAssist - C:\Users\jasonk\Desktop\FloCon 2009.vws

Main Fact Table: Connections

Dashboard

Personal Hot IPs

Personal Hot IP List

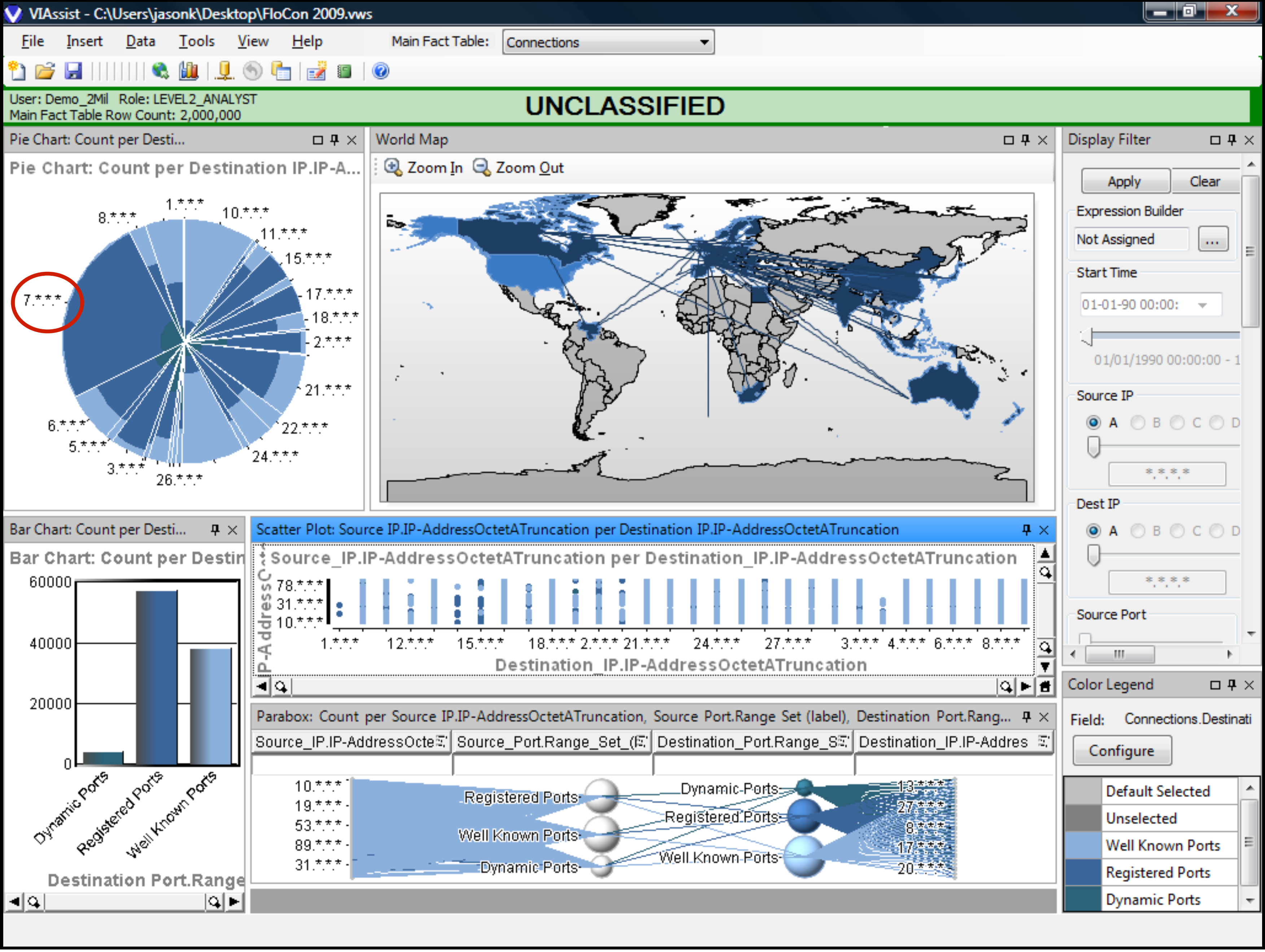
- 57.250.134.112
- 122.121.212.121
- 125.234.234.30

Organizational Hot...

Organizational Hot IP List

- 125.84.195.164
- 125.84.199.114
- 125.87.50.230
- 125.87.64.12
- 125.87.64.23
- 125.87.86.54
- 125.87.144.75
- 125.87.223.253
- 125.88.76.6
- 125.88.76.15
- 125.88.77.7
- 125.89.112.10
- 125.89.226.3
- 125.90.51.154
- 125.90.116.4
- 125.90.168.105
- 125.91.39.194
- 125.91.86.109
- 125.91.92.206
- 125.92.60.60
- 125.92.61.2
- 125.92.61.61
- 125.93.70.46
- 125.93.70.47

2 million unfiltered flows



VIAssist - C:\Users\jasonk\Desktop\FloCon 2009.vws

Main Fact Table: Connections

User: Demo_2Mil Role: LEVEL2_ANALYST
Main Fact Table Row Count: 2,000,000

UNCLASSIFIED

Expression Builder: Not Assigned

Start Time: 01-01-90 00:00:
01/01/1990 00:00:00 - 1

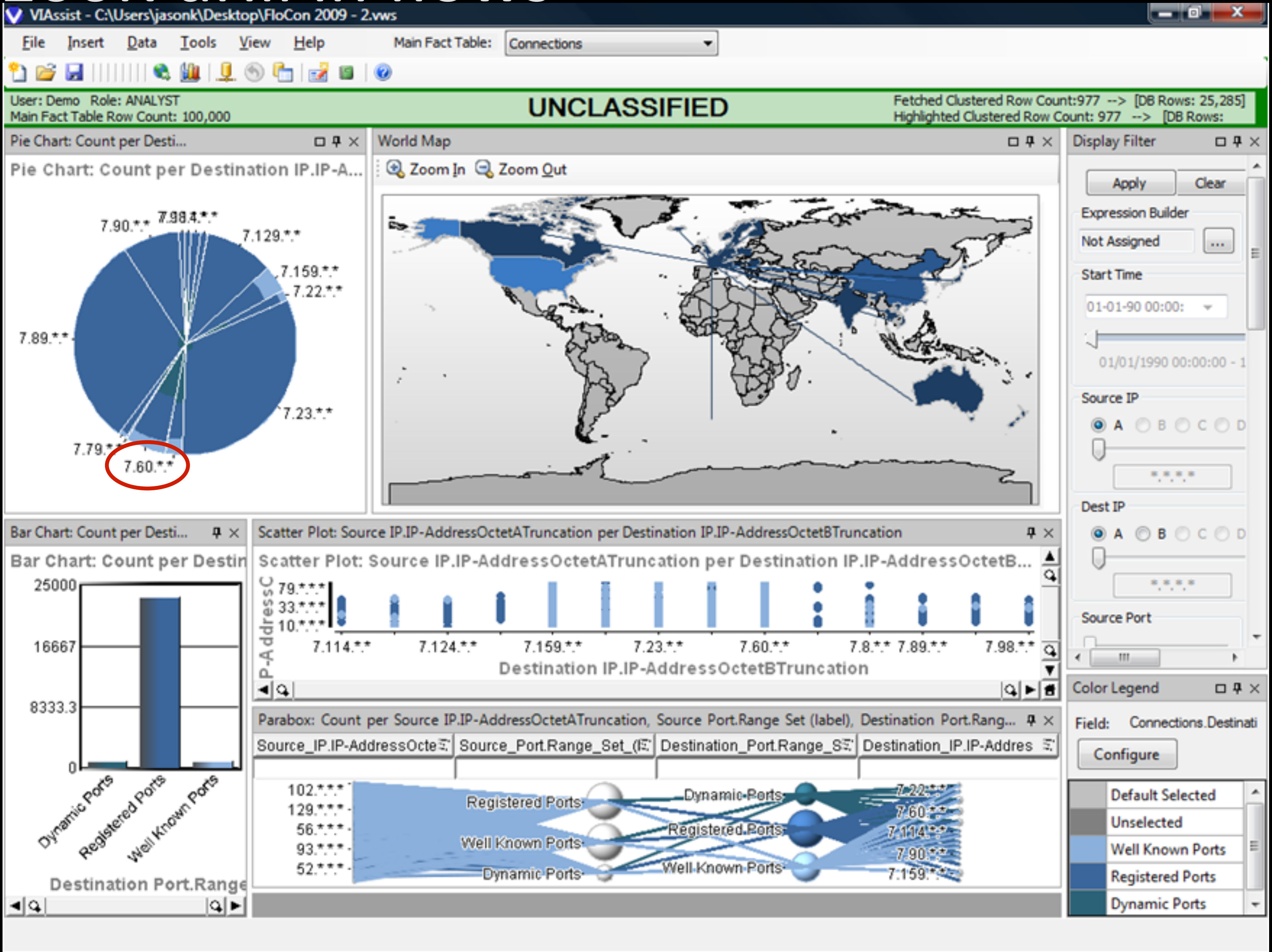
Source IP: ● A ○ B ○ C ○ D
..*.*

Dest IP: ● A ○ B ○ C ○ D
..*.*

Color Legend
Field: Connections.Destinati

▨	Default Selected
▨	Unselected
▨	Well Known Ports
▨	Registered Ports
▨	Dynamic Ports

100K drill in flows



VIAssist - C:\Users\jasonk\Desktop\FloCon 2009 - 2.vws

Main Fact Table: Connections

User: Demo Role: ANALYST
Main Fact Table Row Count: 100,000

UNCLASSIFIED

Fetched Clustered Row Count:977 --> [DB Rows: 25,285]
Highlighted Clustered Row Count: 977 --> [DB Rows:

Expression Builder: Not Assigned

Start Time: 01-01-90 00:00:

01/01/1990 00:00:00 - 1

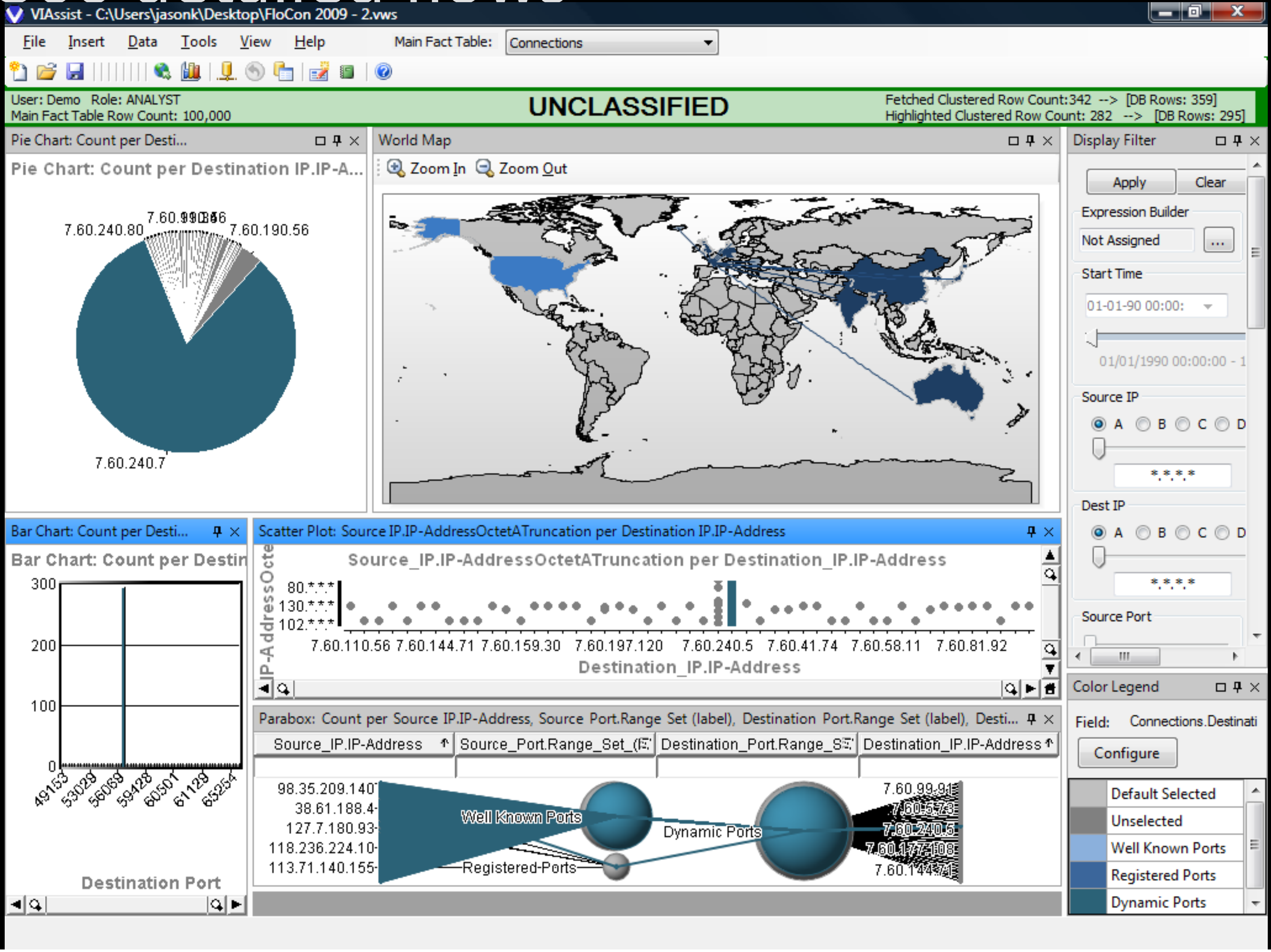
Source IP: ● A ○ B ○ C ○ D

Dest IP: ● A ○ B ○ C ○ D

Field: Connections.Destinati

Color Legend
Default Selected
Unselected
Well Known Ports
Registered Ports
Dynamic Ports

300 detailed flows



VIAssist - C:\Users\jasonk\Desktop\FloCon 2009 - 2.vws

Main Fact Table: Connections

User: Demo Role: ANALYST
Main Fact Table Row Count: 100,000

UNCLASSIFIED

Fetched Clustered Row Count:342 --> [DB Rows: 359]
Highlighted Clustered Row Count: 282 --> [DB Rows: 295]

Pie Chart: Count per Destination IP.IP-A...

World Map

Display Filter

Expression Builder: Not Assigned

Start Time: 01-01-90 00:00:

01/01/1990 00:00:00 - 1

Source IP: ● A ○ B ○ C ○ D — *.*.*.*

Dest IP: ● A ○ B ○ C ○ D — *.*.*.*

Source Port

Bar Chart: Count per Destin

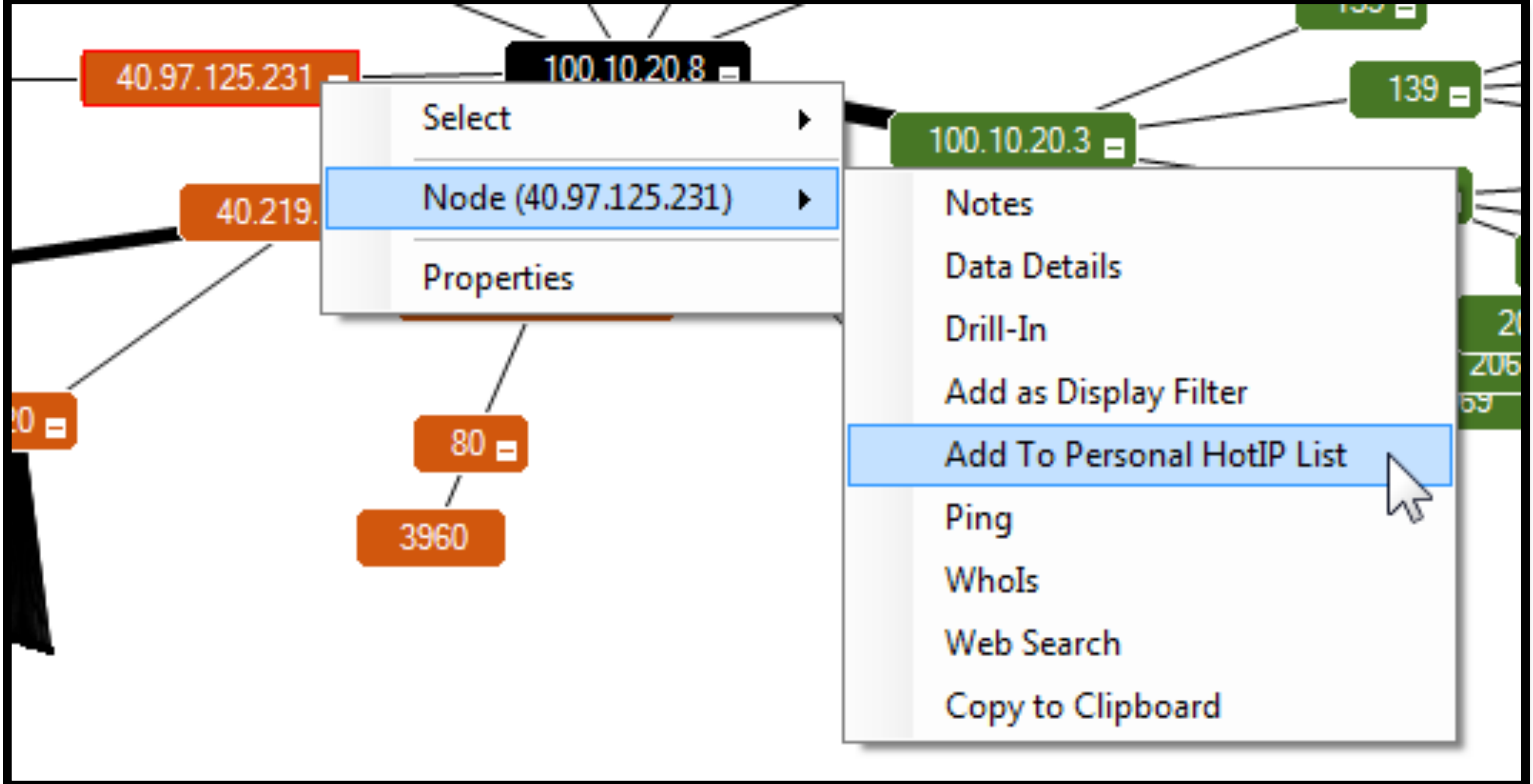
Scatter Plot: Source IP.IP-AddressOctetATruncation per Destination IP.IP-Address

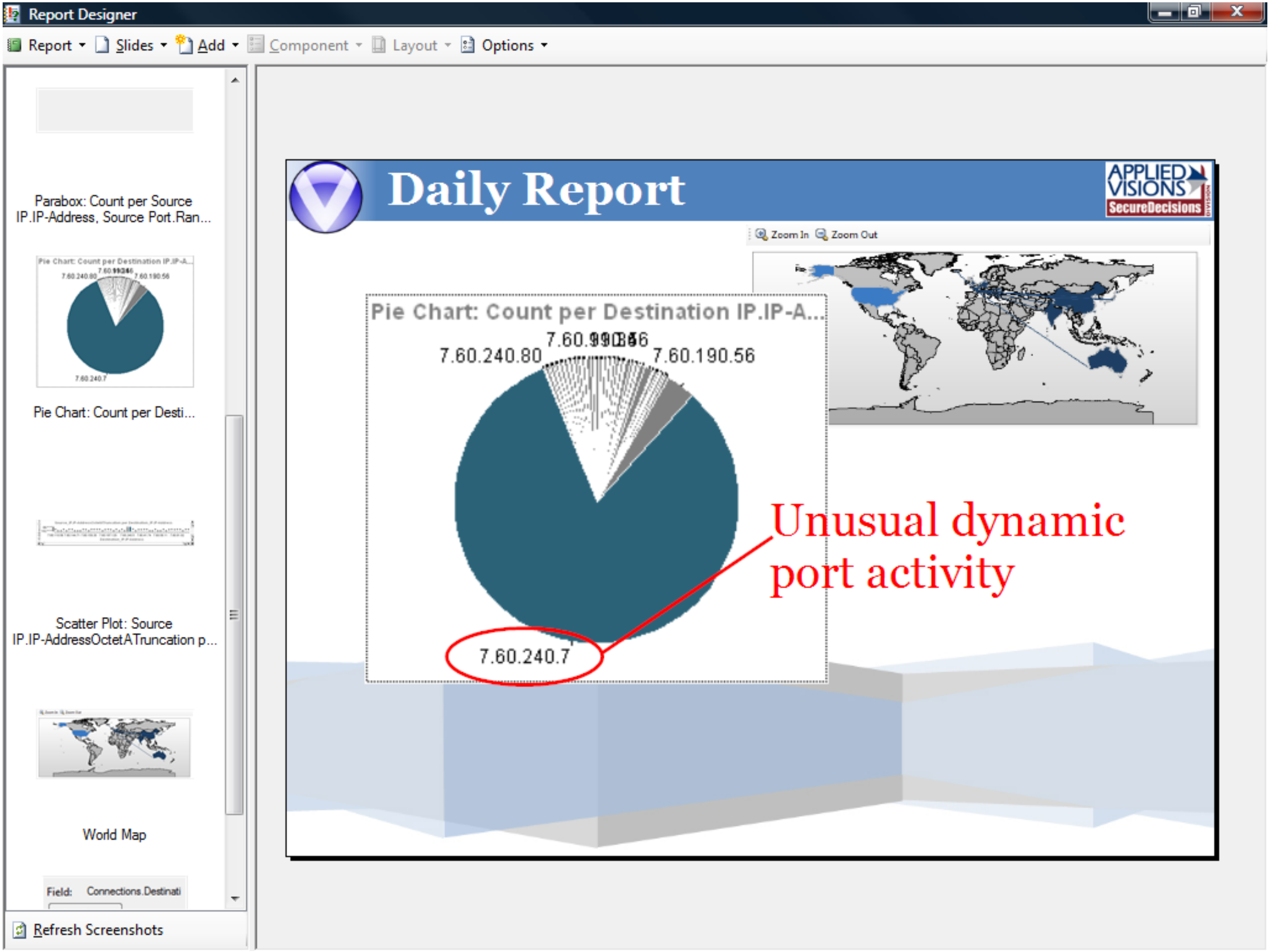
Parabox: Count per Source IP.IP-Address, Source Port.Range Set (label), Destination Port.Range Set (label), Desti...

Color Legend

Field: Connections.Destinati

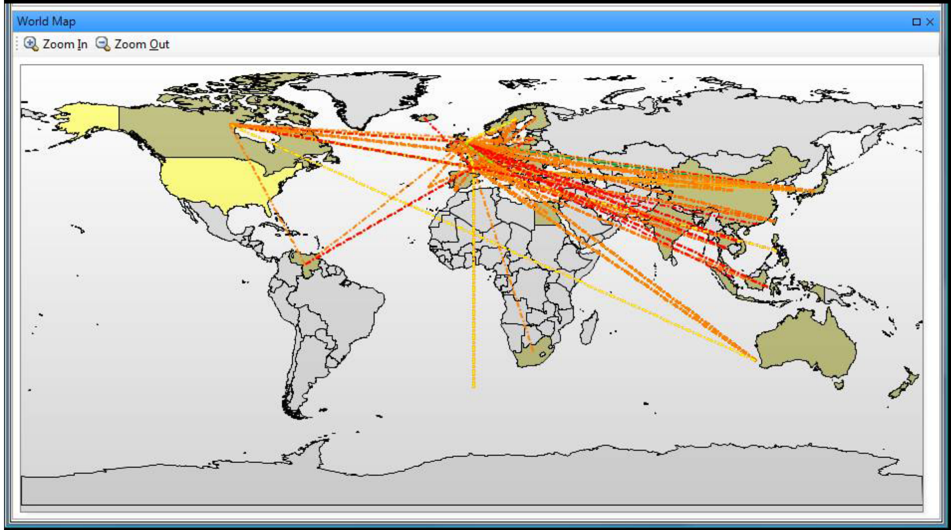
▢	Default Selected
▢	Unselected
▢	Well Known Ports
▢	Registered Ports
▢	Dynamic Ports

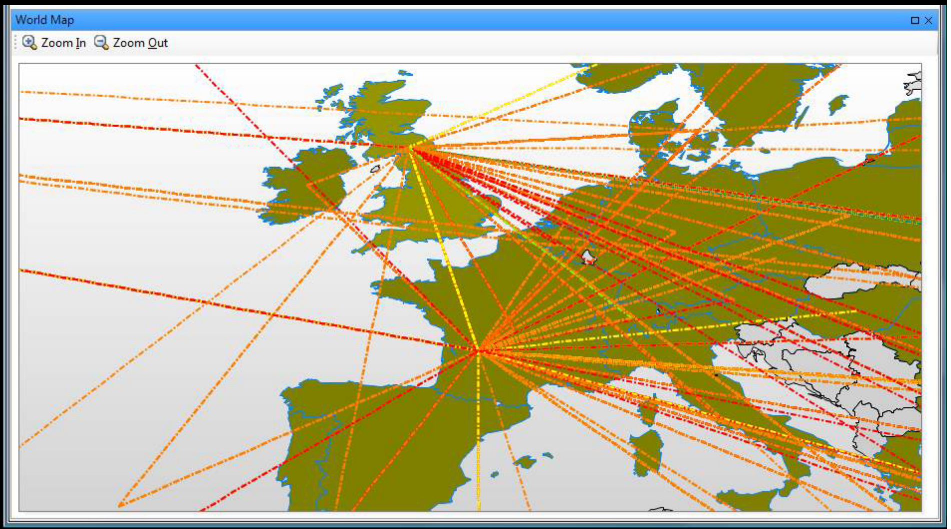

40.97.125.231
100.10.20.8
100.10.20.3
139
40.219.
80
3960
Select
Node (40.97.125.231)
Properties
Notes
Data Details
Drill-In
Add as Display Filter
Add To Personal HotIP List
Ping
WhoIs
Web Search
Copy to Clipboard

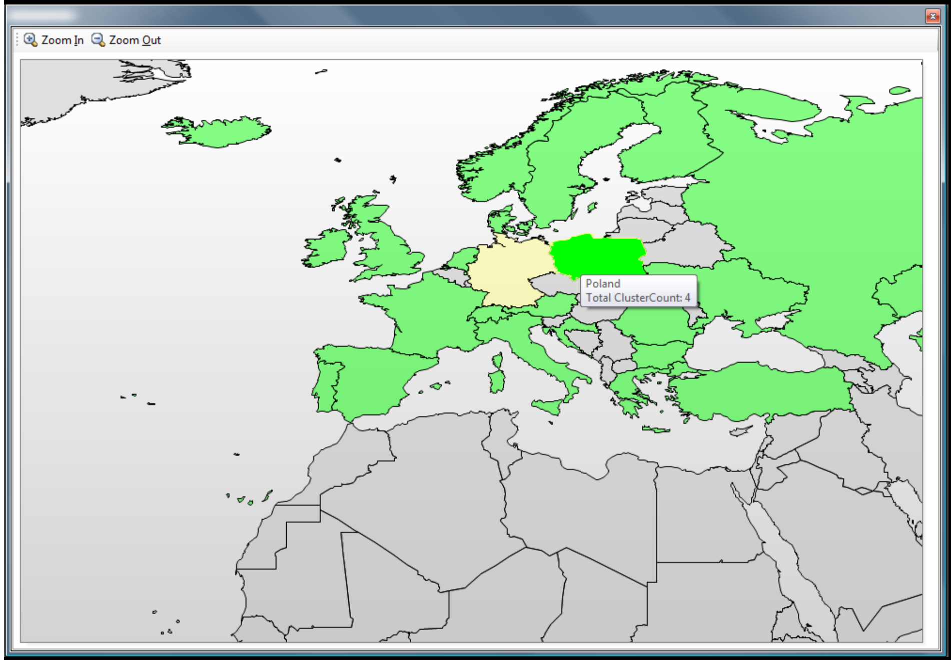

Report Designer
Report
Slides
Add
Component
Layout
Options
Parabox: Count per Source IP.IP-Address, Source Port.Ran...
Pie Chart: Count per Desti...
Scatter Plot: Source IP.IP-AddressOctetATruncation p...
World Map
Field: Connections.Destinati
Refresh Screenshots
APPLIED VISIONS
SecureDecisions
Zoom In
Zoom Out
Pie Chart: Count per Destination IP.IP-A...
7.60.240.80
7.60.99.186
7.60.190.56
7.60.240.7

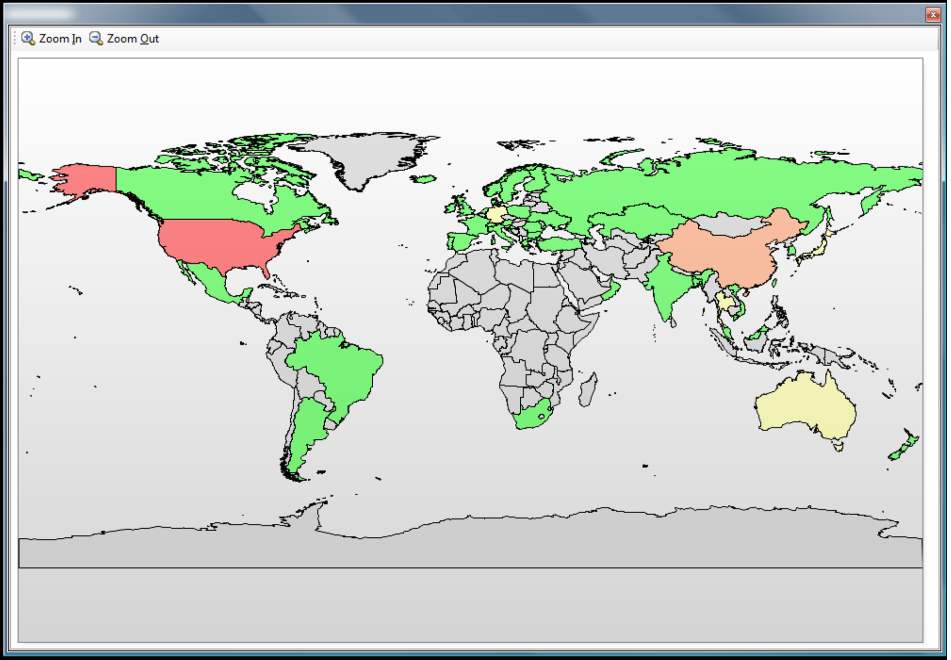
Daily Report

Unusual dynamic port activity

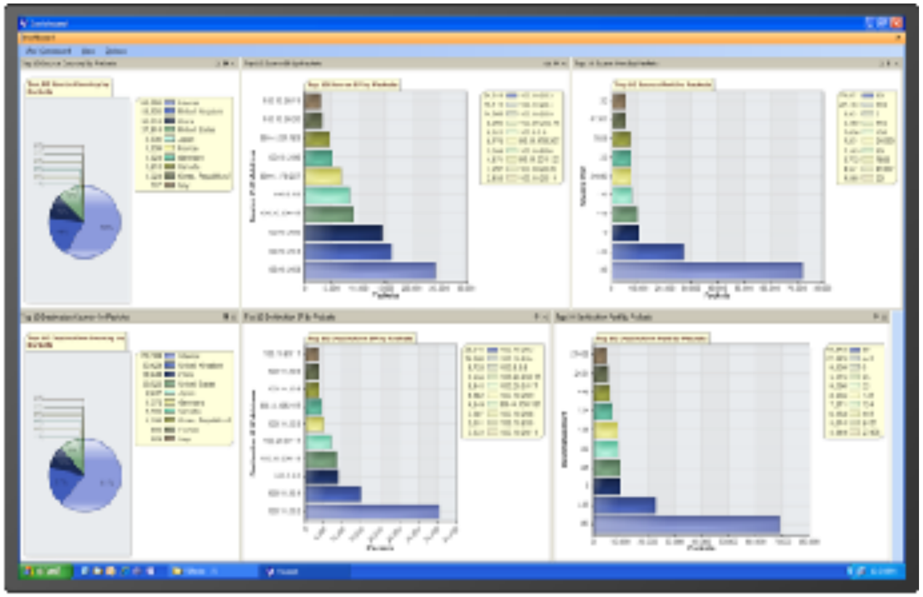

World Map
Zoom In
Zoom Out


World Map
Zoom In
Zoom Out


Zoom In
Zoom Out
Poland
Total ClusterCount: 4


Zoom In
Zoom Out

UNCLASSIFIED



Dr. John Goodall, johng@avi.com
Jason Kopylec, jasonk@avi.com

http://www.securedecisions.com/viassist