

Désactivation des messages de type INFO ...

Création d'un session spark (SparkSession) ...

Using Spark's default log4j profile: org/apache/spark/log4j-defaults.properties

Récupération du traceroute exemple ...

```
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| af|   dst_addr|   dst_name|   endtime|         from|   fw|lts|msm_id|   msm_name|paris_id|prb_id|proto|
result|size|   src_addr|stored_timestamp| timestamp|         type|
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|  4|192.5.5.241|192.5.5.241|1514768403|89.105.202.4|4790|165|  5004|Traceroute|      9|  4247|  UDP|
[[1,WrappedArray(...|  40|89.105.202.4|      1514768539|1514768409|traceroute|
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
```

root

```
|-- af: long (nullable = true)
|-- dst_addr: string (nullable = true)
|-- dst_name: string (nullable = true)
|-- endtime: long (nullable = true)
|-- from: string (nullable = true)
|-- fw: long (nullable = true)
|-- lts: long (nullable = true)
|-- msm_id: long (nullable = true)
|-- msm_name: string (nullable = true)
|-- paris_id: long (nullable = true)
|-- prb_id: long (nullable = true)
|-- proto: string (nullable = true)
|-- result: array (nullable = true)
|   |-- element: struct (containsNull = true)
|   |   |-- hop: long (nullable = true)
|   |   |-- result: array (nullable = true)
|   |   |   |-- element: struct (containsNull = true)
|   |   |   |   |-- from: string (nullable = true)
|   |   |   |   |-- rtt: double (nullable = true)
|   |   |   |   |-- size: long (nullable = true)
|   |   |   |   |-- ttl: long (nullable = true)
|-- size: long (nullable = true)
|-- src_addr: string (nullable = true)
|-- stored_timestamp: long (nullable = true)
|-- timestamp: long (nullable = true)
|-- type: string (nullable = true)
```

Suppression des données inutiles dans l'analyse des délais ...

```
+-----+-----+-----+-----+-----+-----+
| dst_addr|      from|msm_id|prb_id|      result|      src_addr| timestamp|
+-----+-----+-----+-----+-----+-----+
|192.5.5.241|89.105.202.4| 5004| 4247|[[1,WrappedArray(...|89.105.202.4|1514768409|
+-----+-----+-----+-----+-----+-----+
```

Renommer l'attribut result suite à la présence d'un attribut du même nom, à un niveau différent (structure JSON)

```
...
root
|-- dst_addr: string (nullable = true)
|-- prb_ip: string (nullable = true)
|-- msm_id: long (nullable = true)
|-- prb_id: long (nullable = true)
|-- hopsDetails: array (nullable = true)
|   |-- element: struct (containsNull = true)
|   |   |-- hop: long (nullable = true)
|   |   |-- result: array (nullable = true)
|   |   |   |-- element: struct (containsNull = true)
|   |   |   |   |-- from: string (nullable = true)
|   |   |   |   |-- rtt: double (nullable = true)
|   |   |   |   |-- size: long (nullable = true)
|   |   |   |   |-- ttl: long (nullable = true)
|-- src_addr: string (nullable = true)
|-- timestamp: long (nullable = true)
```

```
+-----+-----+-----+-----+-----+-----+
| dst_addr|      prb_ip|msm_id|prb_id|      hopsDetails|      src_addr| timestamp|
+-----+-----+-----+-----+-----+-----+
|192.5.5.241|89.105.202.4| 5004| 4247|[[1,WrappedArray(...|89.105.202.4|1514768409|
+-----+-----+-----+-----+-----+-----+
```

Applatis la liste contenant les sauts ...

```
root
|-- dst_addr: string (nullable = true)
|-- prb_ip: string (nullable = true)
|-- msm_id: long (nullable = true)
|-- prb_id: long (nullable = true)
|-- src_addr: string (nullable = true)
|-- timestamp: long (nullable = true)
|-- hopDetails: struct (nullable = true)
```

```

| | -- hop: long (nullable = true)
| | -- result: array (nullable = true)
| | | -- element: struct (containsNull = true)
| | | | -- from: string (nullable = true)
| | | | -- rtt: double (nullable = true)
| | | | -- size: long (nullable = true)
| | | | -- ttl: long (nullable = true)

```

dst_addr	prb_ip	msm_id	prb_id	src_addr	timestamp	hopDetails
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	[1,WrappedArray([...]
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	[2,WrappedArray([...]
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	[3,WrappedArray([...]
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	[4,WrappedArray([...]
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	[5,WrappedArray([...]
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	[6,WrappedArray([...]
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	[7,WrappedArray([...]

Vérification des erreurs dans le traceroute analysé

Le traceroute est réussi ...

root

```

|-- dst_addr: string (nullable = true)
|-- prb_ip: string (nullable = true)
|-- msm_id: long (nullable = true)
|-- prb_id: long (nullable = true)
|-- src_addr: string (nullable = true)
|-- timestamp: long (nullable = true)
|-- hop: long (nullable = true)
|-- signalDetails: struct (nullable = true)
| | -- from: string (nullable = true)
| | -- rtt: double (nullable = true)
| | -- size: long (nullable = true)
| | -- ttl: long (nullable = true)

```

dst_addr	prb_ip	msm_id	prb_id	src_addr	timestamp	hop	signalDetails
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	1	[89.105.200.50,1....]
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	1	[10.10.0.5,1.7,28...
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	1	[89.105.200.57,1....]

192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	2	[185.147.12.31,7....
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	2	[185.147.12.31,3....
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	2	[185.147.12.0,3.1...
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	3	[185.147.12.19,4....
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	3	[185.147.12.19,2....
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	3	[185.147.12.19,3....
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	4	[160.242.100.88,3...
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	4	[160.242.100.88,3...
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	4	[160.242.100.88,1...
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	5	[196.216.48.144,4...
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	5	[196.216.48.144,6...
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	5	[196.216.48.144,1...
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	6	[193.239.116.112,...
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	6	[193.239.116.112,...
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	6	[193.239.116.112,...
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	7	[192.5.5.241,8.22...
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	7	[192.5.5.241,8.02...

only showing top 20 rows

Applatir les détails de signal et suppression des données inutiles (size, ttl, etc) de chaque signal ...

root

```
-- dst_addr: string (nullable = true)
-- prb_ip: string (nullable = true)
-- msm_id: long (nullable = true)
-- prb_id: long (nullable = true)
-- src_addr: string (nullable = true)
-- timestamp: long (nullable = true)
-- hop: long (nullable = true)
-- rtt: double (nullable = true)
-- from: string (nullable = true)
```

dst_addr	prb_ip	msm_id	prb_id	src_addr	timestamp	hop	rtt	from
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	1	1.955	89.105.200.50
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	1	1.7	10.10.0.5
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	1	1.709	89.105.200.57
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	2	7.543	185.147.12.31
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	2	3.103	185.147.12.31
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	2	3.172	185.147.12.0
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	3	4.347	185.147.12.19

192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	3	2.876	185.147.12.19
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	3	3.143	185.147.12.19
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	4	3.655	160.242.100.88
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	4	3.678	160.242.100.88
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	4	15.568	160.242.100.88
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	5	4.263	196.216.48.144
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	5	6.082	196.216.48.144
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	5	11.834	196.216.48.144
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	6	7.802	193.239.116.112
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	6	7.691	193.239.116.112
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	6	7.711	193.239.116.112
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	7	8.228	192.5.5.241
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	7	8.026	192.5.5.241
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	7	8.254	192.5.5.241

Vérification des RTTs : un RTT doit être strictement positif ...

Checking RTT values ...

dst_addr	prb_ip	msm_id	prb_id	src_addr	timestamp	hop	rtt	from
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	1	1.955	89.105.200.50
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	1	1.7	10.10.0.5
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	1	1.709	89.105.200.57
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	2	7.543	185.147.12.31
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	2	3.103	185.147.12.31
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	2	3.172	185.147.12.0
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	3	4.347	185.147.12.19
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	3	2.876	185.147.12.19
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	3	3.143	185.147.12.19
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	4	3.655	160.242.100.88
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	4	3.678	160.242.100.88
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	4	15.568	160.242.100.88
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	5	4.263	196.216.48.144
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	5	6.082	196.216.48.144
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	5	11.834	196.216.48.144
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	6	7.802	193.239.116.112
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	6	7.691	193.239.116.112
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	6	7.711	193.239.116.112
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	7	8.228	192.5.5.241
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	7	8.026	192.5.5.241

only showing top 20 rows

End checking RTT values ...

dst_addr	prb_ip	msm_id	prb_id	src_addr	timestamp	hop	rtt	from
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	1	1.955	89.105.200.50
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	1	1.7	10.10.0.5
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	1	1.709	89.105.200.57
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	2	7.543	185.147.12.31
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	2	3.103	185.147.12.31
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	2	3.172	185.147.12.0
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	3	4.347	185.147.12.19
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	3	2.876	185.147.12.19
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	3	3.143	185.147.12.19
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	4	3.655	160.242.100.88
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	4	3.678	160.242.100.88
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	4	15.568	160.242.100.88
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	5	4.263	196.216.48.144
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	5	6.082	196.216.48.144
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	5	11.834	196.216.48.144
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	6	7.802	193.239.116.112
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	6	7.691	193.239.116.112
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	6	7.711	193.239.116.112
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	7	8.228	192.5.5.241
192.5.5.241	89.105.202.4	5004	4247	89.105.202.4	1514768409	7	8.026	192.5.5.241

only showing top 20 rows

Vérification des adresses IP : une adresse IP ne peut pas être privée ...

Création d'une vue à partir du DataFrame ...

Calcul de la médiane des RTTs par hop et par routeur source du signal avec la méthode percentile_approx ...

```
[Stage 12:> (0 + 0) / 200]
[Stage 12:====> (20 + 2) / 200]
[Stage 12:=====> (33 + 1) / 200]
[Stage 12:=====> (48 + 1) / 200]
[Stage 12:=====> (62 + 1) / 200]
[Stage 12:=====> (77 + 2) / 200]
[Stage 12:=====> (95 + 1) / 200]
[Stage 12:=====> (110 + 2) / 200]
[Stage 12:=====> (132 + 1) / 200]
```

[Stage 12:=====> (156 + 1) / 200]
 [Stage 12:=====> (178 + 1) / 200]
 [Stage 12:=====> (198 + 1) / 200]

hop	pre_from	msm_id	prb_id	median
1	89.105.200.50	5004	4247	1.955
1	89.105.200.57	5004	4247	1.709
2	185.147.12.31	5004	4247	7.543
2	185.147.12.0	5004	4247	3.172
3	185.147.12.19	5004	4247	3.143
4	160.242.100.88	5004	4247	3.678
5	196.216.48.144	5004	4247	6.082
6	193.239.116.112	5004	4247	7.711
7	192.5.5.241	5004	4247	8.228

[Stage 14:=====> (65 + 1) / 200]
 [Stage 14:=====> (95 + 1) / 200]
 [Stage 14:=====> (123 + 1) / 200]
 [Stage 14:=====> (153 + 1) / 200]
 [Stage 14:=====> (185 + 1) / 200]

[Stage 16:=====> (72 + 1) / 200]
 [Stage 16:=====> (99 + 1) / 200]
 [Stage 16:=====> (132 + 1) / 200]
 [Stage 16:=====> (169 + 1) / 200]
 [Stage 16:=====> (194 + 1) / 200]

hop	pre_from	median
1	[89.105.200.50, 89.105.200.57]	[1.955, 1.709]
2	[185.147.12.0, 185.147.12.31]	[3.172, 7.543]
3	[185.147.12.19]	[3.143]
4	[160.242.100.88]	[3.678]
5	[196.216.48.144]	[6.082]
6	[193.239.116.112]	[7.711]

7	[192.5.5.241]	[8.228]
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```
[Stage 25:=====> (89 + 1) / 200]
[Stage 25:=====> (127 + 1) / 200]
[Stage 25:=====> (159 + 1) / 200]
[Stage 25:=====> (197 + 1) / 200]
```

```
[Stage 27:=====> (94 + 1) / 200]
[Stage 27:=====> (134 + 1) / 200]
[Stage 27:=====> (171 + 1) / 200]
[Stage 27:=====> (197 + 1) / 200]
```

hop	pre_from	median	nextRouters	nextMedians
1	[89.105.200.50, 8...]	[1.955, 1.709]	[185.147.12.0, 18...]	[3.172, 7.543]
2	[185.147.12.0, 18...]	[3.172, 7.543]	[185.147.12.19]	[3.143]
3	[185.147.12.19]	[3.143]	[160.242.100.88]	[3.678]
4	[160.242.100.88]	[3.678]	[196.216.48.144]	[6.082]
5	[196.216.48.144]	[6.082]	[193.239.116.112]	[7.711]
6	[193.239.116.112]	[7.711]	[192.5.5.241]	[8.228]

```
[Stage 31:=====> (82 + 1) / 200]
[Stage 31:=====> (124 + 1) / 200]
[Stage 31:=====> (156 + 1) / 200]
[Stage 31:=====> (197 + 1) / 200]
```

```
[Stage 33:=====> (112 + 1) / 200]
[Stage 33:=====> (152 + 1) / 200]
[Stage 33:=====> (194 + 1) / 200]
```

hop	pre_from	median	next_router
-----	----------	--------	-------------

1	[89.105.200.50, 8...	[1.955, 1.709]	185.147.12.0
1	[89.105.200.50, 8...	[1.955, 1.709]	185.147.12.31
2	[185.147.12.0, 18...	[3.172, 7.543]	185.147.12.19
3	[185.147.12.19]	[3.143]	160.242.100.88
4	[160.242.100.88]	[3.678]	196.216.48.144
5	[196.216.48.144]	[6.082]	193.239.116.112
6	[193.239.116.112]	[7.711]	192.5.5.241

[Stage 37:=====> (128 + 1) / 200]
[Stage 37:=====> (174 + 1) / 200]

[Stage 39:=====> (134 + 1) / 200]
[Stage 39:=====> (167 + 1) / 200]

hop	pre_from	median	next_router	num
1	[89.105.200.50, 8...	[1.955, 1.709]	185.147.12.0	0
1	[89.105.200.50, 8...	[1.955, 1.709]	185.147.12.31	1
2	[185.147.12.0, 18...	[3.172, 7.543]	185.147.12.19	2
3	[185.147.12.19]	[3.143]	160.242.100.88	3
4	[160.242.100.88]	[3.678]	196.216.48.144	4
5	[196.216.48.144]	[6.082]	193.239.116.112	5
6	[193.239.116.112]	[7.711]	192.5.5.241	6

[Stage 43:=====> (127 + 1) / 200]
[Stage 43:=====> (174 + 1) / 200]

[Stage 45:=====> (109 + 1) / 200]
[Stage 45:=====> (141 + 1) / 200]
[Stage 45:=====> (182 + 1) / 200]

hop	pre_from	median	next_median
-----	----------	--------	-------------

1	[89.105.200.50, 8...	[1.955, 1.709]	3.172
1	[89.105.200.50, 8...	[1.955, 1.709]	7.543
2	[185.147.12.0, 18...	[3.172, 7.543]	3.143
3	[185.147.12.19]	[3.143]	3.678
4	[160.242.100.88]	[3.678]	6.082
5	[196.216.48.144]	[6.082]	7.711
6	[193.239.116.112]	[7.711]	8.228

[Stage 49:=====> (121 + 1) / 200]
[Stage 49:=====> (162 + 1) / 200]

[Stage 51:=====> (127 + 1) / 200]
[Stage 51:=====> (172 + 1) / 200]

hop	pre_from	median	next_median	num
1	[89.105.200.50, 8...	[1.955, 1.709]	3.172	0
1	[89.105.200.50, 8...	[1.955, 1.709]	7.543	1
2	[185.147.12.0, 18...	[3.172, 7.543]	3.143	2
3	[185.147.12.19]	[3.143]	3.678	3
4	[160.242.100.88]	[3.678]	6.082	4
5	[196.216.48.144]	[6.082]	7.711	5
6	[193.239.116.112]	[7.711]	8.228	6

[Stage 55:=====> (137 + 1) / 200]
[Stage 55:=====> (188 + 1) / 200]

[Stage 57:=====> (113 + 1) / 200]
[Stage 57:=====> (157 + 1) / 200]
[Stage 57:=====> (198 + 1) / 200]

```
[Stage 61:=====> (92 + 1) / 200]
[Stage 61:=====> (119 + 1) / 200]
[Stage 61:=====> (166 + 1) / 200]
[Stage 61:=====> (193 + 1) / 200]
```

```
[Stage 63:=====> (110 + 1) / 200]
[Stage 63:=====> (148 + 1) / 200]
[Stage 63:=====> (179 + 1) / 200]
```

hop	pre_from	median	next_router	next_median
1	[89.105.200.50, 8...	[1.955, 1.709]	185.147.12.0	3.172
1	[89.105.200.50, 8...	[1.955, 1.709]	185.147.12.31	7.543
2	[185.147.12.0, 18...	[3.172, 7.543]	185.147.12.19	3.143
3	[185.147.12.19]	[3.143]	160.242.100.88	3.678
4	[160.242.100.88]	[3.678]	196.216.48.144	6.082
5	[196.216.48.144]	[6.082]	193.239.116.112	7.711
6	[193.239.116.112]	[7.711]	192.5.5.241	8.228

```
[Stage 67:=====> (108 + 1) / 200]
[Stage 67:=====> (138 + 1) / 200]
[Stage 67:=====> (175 + 1) / 200]
```

```
[Stage 69:=====> (111 + 1) / 200]
[Stage 69:=====> (151 + 1) / 200]
[Stage 69:=====> (191 + 1) / 200]
```

```
[Stage 73:=====> (126 + 2) / 200]
[Stage 73:=====> (168 + 1) / 200]
[Stage 73:=====> (187 + 2) / 200]
```

```
[Stage 75:=====> (124 + 1) / 200]
[Stage 75:=====> (169 + 1) / 200]
```

hop	next_median	next_router	next_median	previous_router
1	3.172	185.147.12.0	3.172	89.105.200.50
1	3.172	185.147.12.0	3.172	89.105.200.57
1	7.543	185.147.12.31	7.543	89.105.200.50
1	7.543	185.147.12.31	7.543	89.105.200.57
2	3.143	185.147.12.19	3.143	185.147.12.0
2	3.143	185.147.12.19	3.143	185.147.12.31
3	3.678	160.242.100.88	3.678	185.147.12.19
4	6.082	196.216.48.144	6.082	160.242.100.88
5	7.711	193.239.116.112	7.711	196.216.48.144
6	8.228	192.5.5.241	8.228	193.239.116.112

[Stage 79:=====> (125 + 1) / 200]
[Stage 79:=====> (175 + 1) / 200]

[Stage 81:=====> (147 + 1) / 200]
[Stage 81:=====> (197 + 1) / 200]

[Stage 85:=====> (151 + 2) / 200]
[Stage 85:=====> (190 + 1) / 200]

[Stage 87:=====> (165 + 1) / 200]

hop	next_median	next_router	next_median	previous_router	num
1	3.172	185.147.12.0	3.172	89.105.200.50	0
1	3.172	185.147.12.0	3.172	89.105.200.57	1
1	7.543	185.147.12.31	7.543	89.105.200.50	2
1	7.543	185.147.12.31	7.543	89.105.200.57	3
2	3.143	185.147.12.19	3.143	185.147.12.0	4
2	3.143	185.147.12.19	3.143	185.147.12.31	5
3	3.678	160.242.100.88	3.678	185.147.12.19	6
4	6.082	196.216.48.144	6.082	160.242.100.88	7

5	7.711	193.239.116.112	7.711	196.216.48.144	8
6	8.228	192.5.5.241	8.228	193.239.116.112	9
+--+	+-----+	+-----+	+-----+	+-----+	+--+

[Stage 91:=====> (149 + 1) / 200]
[Stage 91:=====> (196 + 1) / 200]

[Stage 93:=====> (140 + 1) / 200]
[Stage 93:=====> (175 + 1) / 200]

[Stage 97:=====> (181 + 1) / 200]

[Stage 99:=====> (159 + 1) / 200]
[Stage 99:=====> (199 + 1) / 200]

hop	next_router	next_median	previous_median
+--+	+-----+	+-----+	+-----+
1	185.147.12.0	3.172	1.955
1	185.147.12.0	3.172	1.709
1	185.147.12.31	7.543	1.955
1	185.147.12.31	7.543	1.709
2	185.147.12.19	3.143	3.172
2	185.147.12.19	3.143	7.543
3	160.242.100.88	3.678	3.143
4	196.216.48.144	6.082	3.678
5	193.239.116.112	7.711	6.082
6	192.5.5.241	8.228	7.711
+--+	+-----+	+-----+	+-----+

[Stage 103:=====> (177 + 1) / 200]

[Stage 105:=====> (166 + 1) / 200]

[Stage 109:=====> (127 + 1) / 200]
 [Stage 109:=====> (184 + 1) / 200]

[Stage 111:=====> (168 + 1) / 200]

hop	next_router	next_median	previous_median	num
1	185.147.12.0	3.172	1.955	0
1	185.147.12.0	3.172	1.709	1
1	185.147.12.31	7.543	1.955	2
1	185.147.12.31	7.543	1.709	3
2	185.147.12.19	3.143	3.172	4
2	185.147.12.19	3.143	7.543	5
3	160.242.100.88	3.678	3.143	6
4	196.216.48.144	6.082	3.678	7
5	193.239.116.112	7.711	6.082	8
6	192.5.5.241	8.228	7.711	9

[Stage 115:=====> (128 + 1) / 200]
 [Stage 115:=====> (182 + 2) / 200][Stage 117:> (0 + 0) / 200]

[Stage 117:=====> (129 + 1) / 200]
 [Stage 117:=====> (174 + 1) / 200][Stage 119:> (0 + 0) / 200]

[Stage 119:=====> (175 + 1) / 200][Stage 123:> (0 + 0) / 200]

[Stage 123:=====> (168 + 1) / 200]

[Stage 127:=====> (180 + 1) / 200]

[Stage 129:=====> (171 + 1) / 200]

[Stage 133:=====> (147 + 1) / 200]

[Stage 135:=====> (158 + 1) / 200]

hop	next_router	next_median	previous_median	previous_router
1	185.147.12.0	3.172	1.955	89.105.200.50
1	185.147.12.0	3.172	1.709	89.105.200.57
1	185.147.12.31	7.543	1.955	89.105.200.50
1	185.147.12.31	7.543	1.709	89.105.200.57
2	185.147.12.19	3.143	3.172	185.147.12.0
2	185.147.12.19	3.143	7.543	185.147.12.31
3	160.242.100.88	3.678	3.143	185.147.12.19
4	196.216.48.144	6.082	3.678	160.242.100.88
5	193.239.116.112	7.711	6.082	196.216.48.144
6	192.5.5.241	8.228	7.711	193.239.116.112

[Stage 139:=====> (154 + 1) / 200][Stage 141:> (0 + 0) / 200]

[Stage 141:=====>(187 + 1) / 200][Stage 145:> (0 + 0) / 200]

[Stage 143:(153 + 1) / 200][Stage 145:>(2 + 0) / 200][Stage 149:>(0 + 0) / 200]

[Stage 145:(179 + 1) / 200][Stage 149:>(0 + 0) / 200][Stage 153:>(0 + 0) / 200]

[Stage 149:=====> (183 + 1) / 200][Stage 153:> (0 + 0) / 200]

[Stage 149:=====>(191 + 1) / 200][Stage 153:> (0 + 0) / 200]

[Stage 153:=====>(198 + 1) / 200]

[Stage 157:> (2 + 0) / 200]

[Stage 155:=====>(198 + 1) / 200][Stage 157:> (2 + 0) / 200]

[Stage 157:=====> (186 + 1) / 200]

[Stage 159:=====> (139 + 1) / 200]

[Stage 159:=====> (195 + 1) / 200]

[Stage 163:=====> (193 + 1) / 200]

[Stage 165:=====> (151 + 1) / 200]

[Stage 165:=====>(198 + 1) / 200]

hop	next_router	next_median	previous_median	previous_router	prb_id	msm_id
1	185.147.12.0	3.172	1.955	89.105.200.50	4247	5004
1	185.147.12.0	3.172	1.709	89.105.200.57	4247	5004
1	185.147.12.31	7.543	1.955	89.105.200.50	4247	5004
1	185.147.12.31	7.543	1.709	89.105.200.57	4247	5004
2	185.147.12.19	3.143	3.172	185.147.12.0	4247	5004
2	185.147.12.19	3.143	7.543	185.147.12.31	4247	5004
3	160.242.100.88	3.678	3.143	185.147.12.19	4247	5004
4	196.216.48.144	6.082	3.678	160.242.100.88	4247	5004
5	193.239.116.112	7.711	6.082	196.216.48.144	4247	5004
6	192.5.5.241	8.228	7.711	193.239.116.112	4247	5004

[Stage 169:=====> (145 + 1) / 200][Stage 171:> (0 + 0) / 200]

[Stage 171:=====>(187 + 1) / 200][Stage 175:> (0 + 0) / 200]

[Stage 173:(158 + 1) / 200][Stage 175:>(2 + 0) / 200][Stage 179:>(0 + 0) / 200]


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[Stage 175:(178 + 1) / 200][Stage 179:>(0 + 0) / 200][Stage 183:>(0 + 0) / 200]
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```
[Stage 179:=====>(191 + 1) / 200][Stage 183:> (0 + 0) / 200]
[Stage 183:=> (4 + 0) / 200]
[Stage 181:=====>(199 + 1) / 200][Stage 183:> (4 + 0) / 200]
```

```
[Stage 183:=====> (159 + 1) / 200]
```

```
[Stage 187:=====> (116 + 1) / 200]
[Stage 187:=====> (174 + 1) / 200]
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```
[Stage 189:=====> (180 + 1) / 200]
```

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[Stage 193:=====> (169 + 1) / 200]
```

```
[Stage 195:=====> (172 + 1) / 200]
```

+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+										
hop	next_router	next_median	previous_median	previous_router	prb_id	msm_id	ip1		ip2	rttDiff
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+										
1	185.147.12.0	3.172	1.955	89.105.200.50	4247	5004	185.147.12.0	89.105.200.50		1.217
1	185.147.12.0	3.172	1.709	89.105.200.57	4247	5004	185.147.12.0	89.105.200.57		1.463
1	185.147.12.31	7.543	1.955	89.105.200.50	4247	5004	185.147.12.31	89.105.200.50		5.588
1	185.147.12.31	7.543	1.709	89.105.200.57	4247	5004	185.147.12.31	89.105.200.57		5.834
2	185.147.12.19	3.143	3.172	185.147.12.0	4247	5004	185.147.12.19	185.147.12.0	-0.029000000000000036	
2	185.147.12.19	3.143	7.543	185.147.12.31	4247	5004	185.147.12.19	185.147.12.31		-4.4
3	160.242.100.88	3.678	3.143	185.147.12.19	4247	5004	160.242.100.88	185.147.12.19	0.53500000000000001	
4	196.216.48.144	6.082	3.678	160.242.100.88	4247	5004	196.216.48.144	160.242.100.88		2.404
5	193.239.116.112	7.711	6.082	196.216.48.144	4247	5004	193.239.116.112	196.216.48.144	1.62900000000000004	
6	192.5.5.241	8.228	7.711	193.239.116.112	4247	5004	192.5.5.241	193.239.116.112	0.51699999999999995	
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+										

