



# RIPE Atlas Internals

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# What Is RIPE Atlas?

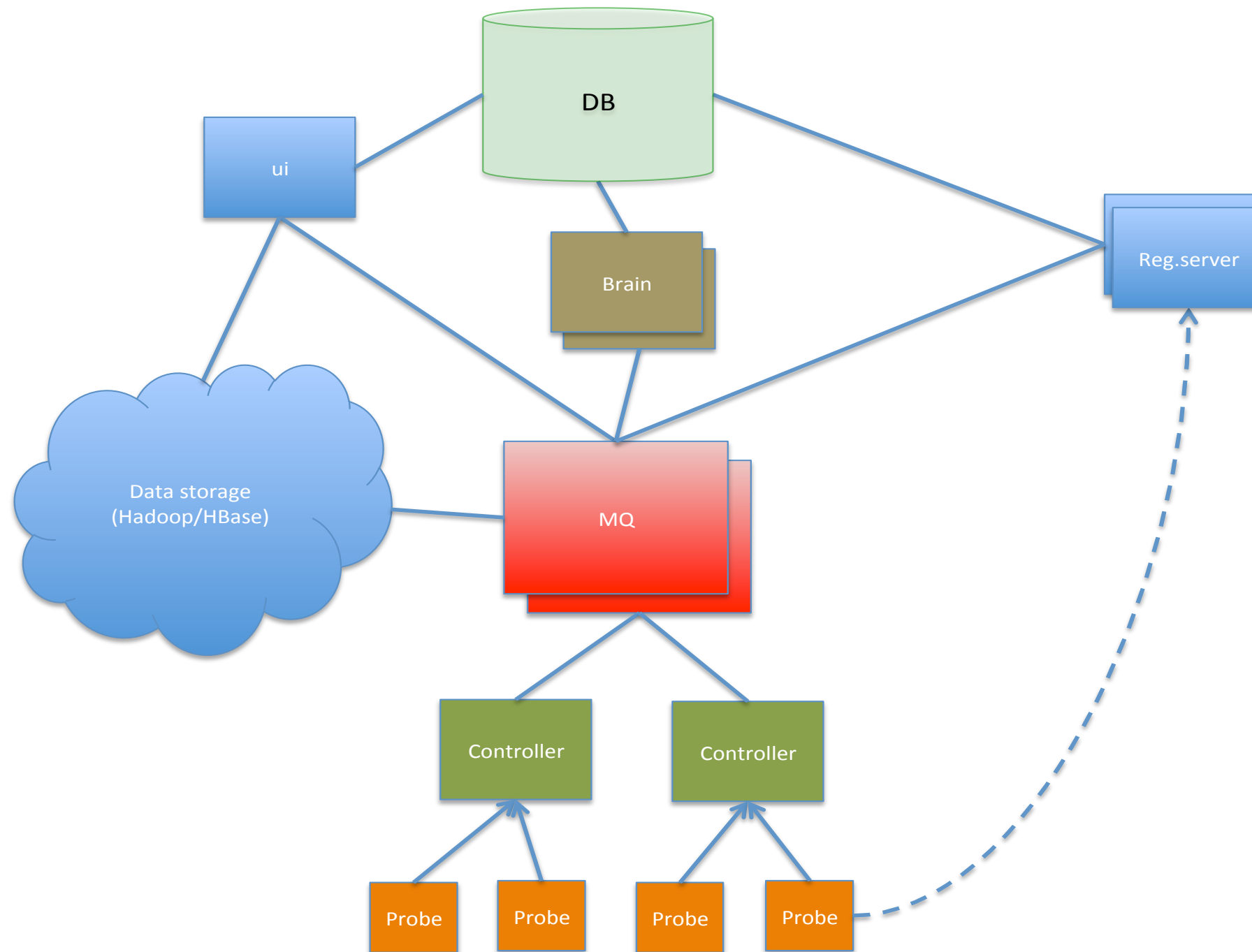
- A measurement network of 4000+ active devices **for** the community, **by** the community
- 4000+ external vantage points at your fingertips, to perform pings & traceroutes towards your preferred destination (and DNS, HTTP, SSL)



# Creating A New Measurement (API)

```
curl -D - -H "Content-Type: application/json" -H "Accept:
application/json" -d @- -X POST https://atlas.ripe.net/api/v1/
measurement/?key=XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX << EOF
{ "definitions":
[
  { "target": "$target", "description": "oneoff $target $type
$af $count", "type": "$type", "af": "$af", "protocol":
"ICMP", "is_oneoff": true }
],
"probes": [ { "requested": 100, "type": "probes", "value":
"6001,6002,6003,6004,6005,6006,6007,6008,6009,6010,6011" } ]
}
EOF
```

# System Overview



# Measurements On The Probe

```
CRONTAB /home/atlas/crons/7
```

```
CRONLINE 240 342 1577836800 UNIFORM 14 evping -6 -c 3 -A "2001"  
-O /home/atlas/data/new/7 2001:7fd::1
```

```
RESULT { "id":"2001", "fw":4550, "lts":47, "time":1380771707, "dst_name":"2001:7fd::1",  
"dst_addr":"2001:7fd::1", "af":6, "src_addr":"2001:67c:2e8:11::c100:136c", "proto":"ICMP",  
"ttl":61, "size":12, "result": [ { "rtt":1.201000 }, { "rtt":1.249000, "srcaddr":"2001:67c:  
2e8:11::c100:136c" }, { "rtt":1.192000, "srcaddr":"2001:67c:2e8:11::c100:136c" } ] }
```

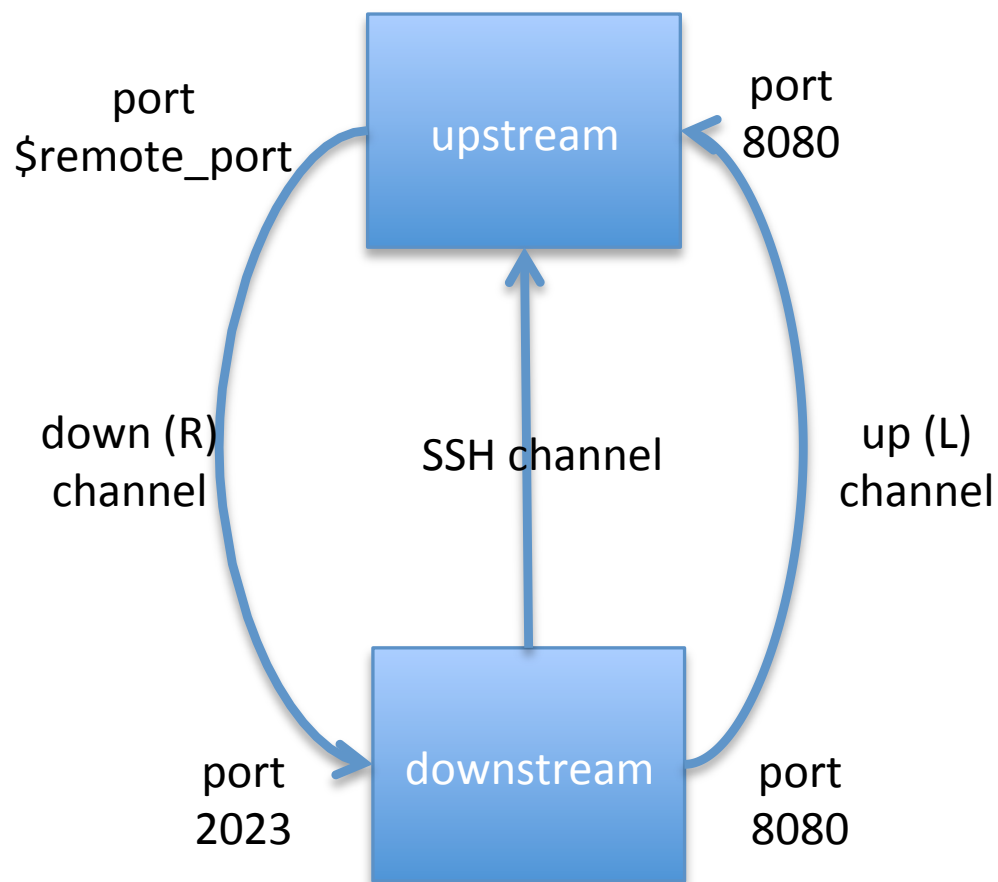
```
ONEOFF /home/atlas/crons/oneoff evtdig -4 --soa aq. --evdns -A  
"1031804" 202.46.190.131
```

```
RESULT { "id" : "1031804" , "time" : 1380771690 , "dst_addr" : "202.46.190.131" , "af" : 4 ,  
"src_addr" : "193.0.19.108" , "proto" : "UDP" , "result" : { "rt" : 291.401 , "size" : 194 ,  
"ID" : 26780 , "ANCOUNT" : 1 , "QDCOUNT" : 1 , "NSCOUNT" : 4 , "ARCOUNT" : 0 , "abuf" :  
"aJyEAAABAAEABAAAAMFxAAAGAAHADAAGAAEAAVGAADsDbnMxA2Ruc8AMCmhvc3RtYXN0ZXIKbG9jYWxjbG91ZAJjbwJueg  
B3/  
Vg9AABtYAAADhAACTqAAAFRgMAMAAIAAQABUYAAFGmb3JrA3N0aAdkbnNub2RlA25ldADADAACAAEAAVGAAGAA8EbnM5OQNk  
bnMDbmV0wEPADAACAAEAAVGAABAGc25zLXBIA2lzYwNvcmcAwAwAAgABAAFRgAACwCA=" , "answers" :  
[ { "TYPE" : "SOA" , "NAME" : "aq." , "TTL" : 86400 , "MNAME" : "ns1.dns.aq." , "RNAME" :  
"hostmaster.localcloud.co.nz." , "SERIAL" : 2013091901 } ] } }
```



# Probe Connections

- Probe: `INIT`
- Reply: `REMOTE_PORT 52876`
- Probe: `ssh -R 50655:127.0.0.1:2023 -L 8080:127.0.0.1:8080 ...`



# Firmware Upgrades

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```
CONTROLLER zelenka.atlas.ripe.net 443 ssh-rsa
AAAAB3NzaC1yc2EAAAABIwAAAQEAO4GVzXooHuqVhmp74lKM5zDbaur/
sh6XZ1im9Vi7u4xyIqZTjM4s2Iio0BrS2VYZJp8jQ0Rj6w4XXMbeTf0NrEUkOSDYcKbPg
gieIiaW7ysDQngpV3AtfW5piv4
sw/vEUIfNwub7Ekwb5Wrt4wLu/pFFUbjftyKPf5rtcrY6lrfwi6QxK9VAu/
XYlaVTqd7NoIsaHbR3kC7aoWWAc5z4OwW1HAfB7nkktAJMP2oA0ShyEfeGey3h5+IcIt
UW8364tgA4wT6vhq9kOxfWTTncC
hLiUtZImL38T8+hkQ0bj09bWCf+YiLlDXH+JU3CRyaRWUTwmgva+eDr3KaZbpNeFQw==
```

```
REREGISTER 3600
```

```
FIRMWARE_KERNEL 1020
```

```
fb1084e7225793ab639f57cea0866b00aea72be67af751dc0b7b85abffef4115 kernel_t1-
mr3020_1020.img.bz2
```

```
FIRMWARE_APPS 4550
```

```
1b0fb537ec86f99c9247bf84bce29570ddf53ca9f82cd0efa8f21196ffe9d6b2 app_t1-
mr3020_4550.img.bz2
```

```
DHCPV4 True
```

```
DHCPV6 True
```

```
PROBE_ID 86
```

```
ssh zelenka.atlas.ripe.net FIRMWARE_APPS app_t1-mr3020_4550.img.bz2
```

# Probe Security

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- Problem:
- `CRONLINE 240 342 1577836800 UNIFORM 14 evping  
-6 -c 3 -A "2001" -O /home/atlas/data/new/7  
2001:7fd::1`
- Controller can cause a probe to write to an arbitrary file...
- Solution: probe checks whether commands are safe
- Firmware upgrades are protected by checking message digests sent by registration servers



# Debug Information

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```
RESULT 9100 done 1380611152 FOUND STATIC CONFIGURATION USING IT
RESULT 9000 done 1380611172 00204AE022D5 STARTING ATLAS system
initialized (reboot count 0)
RESULT 9001 ongoing 1380611172 00204AE022D5 15          11324 1    1
1    1    0    0    0    0    1    1    2
RESULT 9017 ongoing 1380611174
U16.M00204AE022D5.sos.atlas.ripe.net 193.0.19.55 56 2 0 0
RESULT 9011 done 1380611397 00204AE022D5 Starting nice --20
dbclient -p 443 atlas@ipv4.ctr-ams04.atlas.ripe.net MYIPV4
RESULT 9011 done 1380611398 00204AE022D5 ERR 1 stdout
RESULT 9011 done 1380611398 00204AE022D5 stderr dbclient:
exited: Error resolving 'ipv4.ctr-ams04.atlas.ripe.net' port
'443'. Name or service not known
```

# New Features (1/2)

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- Seismograph. Multiple ping measurements in one view. Stacked chart and a control panel to interact with the system
- Zoomable ping graph. Replacing multiple RRDs graphs: zoom in and zoom out in the same graph, without loss of detail
- RIPE Atlas source code published

# New Features (2/2)

- TCP traceroute (implemented but not released yet)
- (For researchers) More detailed http results:
- ```
RESULT { "result":[ { "method":"GET", "af": 4,
  "dst_addr":"193.0.6.139", "readtiming": [ { "o":"0", "t":
4.378000 }, { "o":"2896", "t": 5.896000 }, { "o":"6992", "t":
6.109000 }, { "o":"8688", "t": 7.657000 }, { "o":"12784",
"t": 7.895000 }, { "o":"16880", "t": 8.801000 },
{ "o":"20976", "t": 9.509000 }, { "o":"25072", "t":
9.928000 }, { "o":"29168", "t": 10.149000 }, { "o":"33264",
"t": 10.306000 }, { "o":"37360", "t": 10.453000 } ],
"src_addr":"193.0.10.42", "rt":10.524000, "res":200,
"ver":"1.1", "hsize":279, "bsize":40104, "ttr":3.130000,
"ttc":1.462000, "ttfb":4.347000 } ] }
```

# Questions?

<https://atlas.ripe.net>

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Questions: [atlas@ripe.net](mailto:atlas@ripe.net)

