Tutorial: Using RIPEstat

Christian Teuschel
Research & Development

RIPE 68 | Warsaw - Poland | 12 May 2014

Agenda

- Basics
  - 3 layers of RIPEstat
  - RIPEstat Web
    - Result page
    - Customize the result page
    - Compare results
    - Handling abuse
    - Work with BGPlay

Agenda

- Advanced
  - Work with widgets
    - Create a dashboard
  - RIPEstat Data API
    - Using Javascript to work with raw data
  - Nagios check

RIPEstat

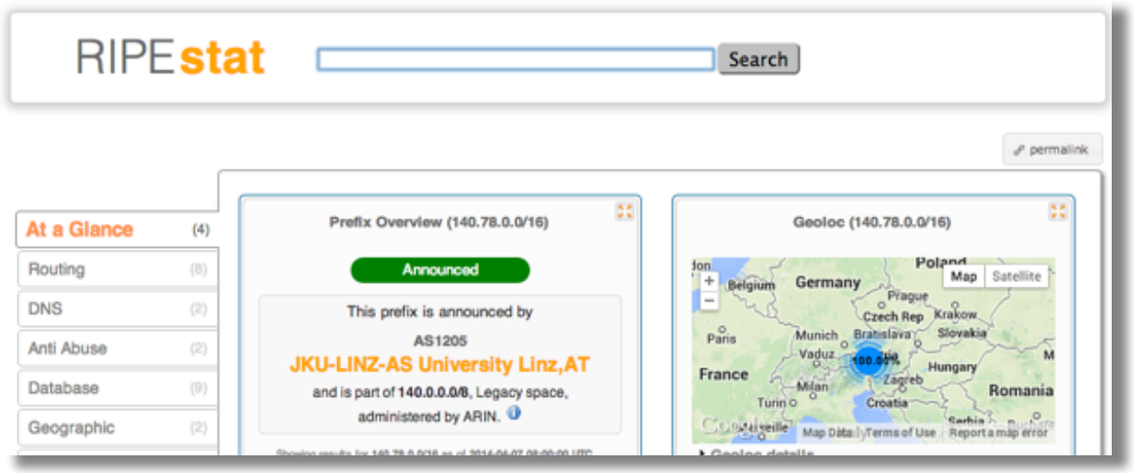
Basics

What is RIPEstat

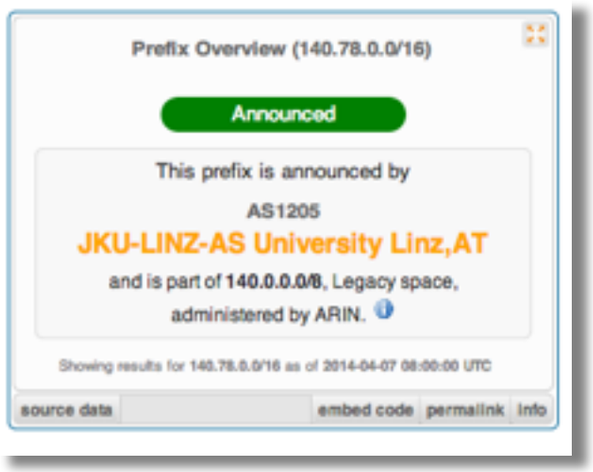
- Information system for Internet number resources
- Data
  - Routing data
    - Collected by RIS: http://ris.ripe.net
    - Registration data (whois)
      - RIPE Database & other RIR databases
    - MaxMind's geolocation data
    - Blacklist data
    - And many more: https://stat.ripe.net/data-sources

Introduction to RIPEstat

- RIPEstat Web
  http://stat.ripe.net



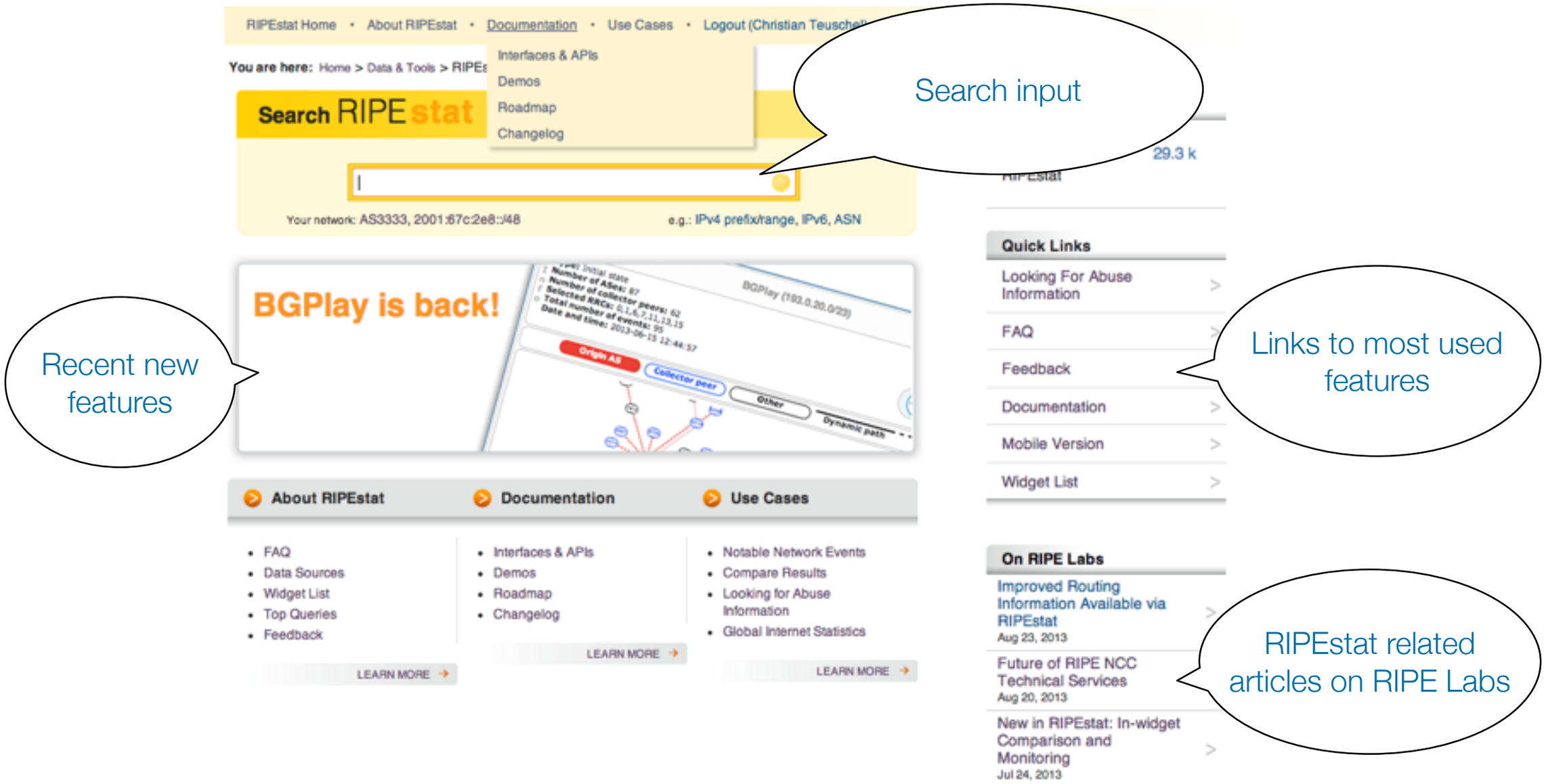
- RIPEstat Widget API



- RIPEstat Data API / RIPEstat Text API
  - https://stat.ripe.net/data/routing-status/data.json?resource=…

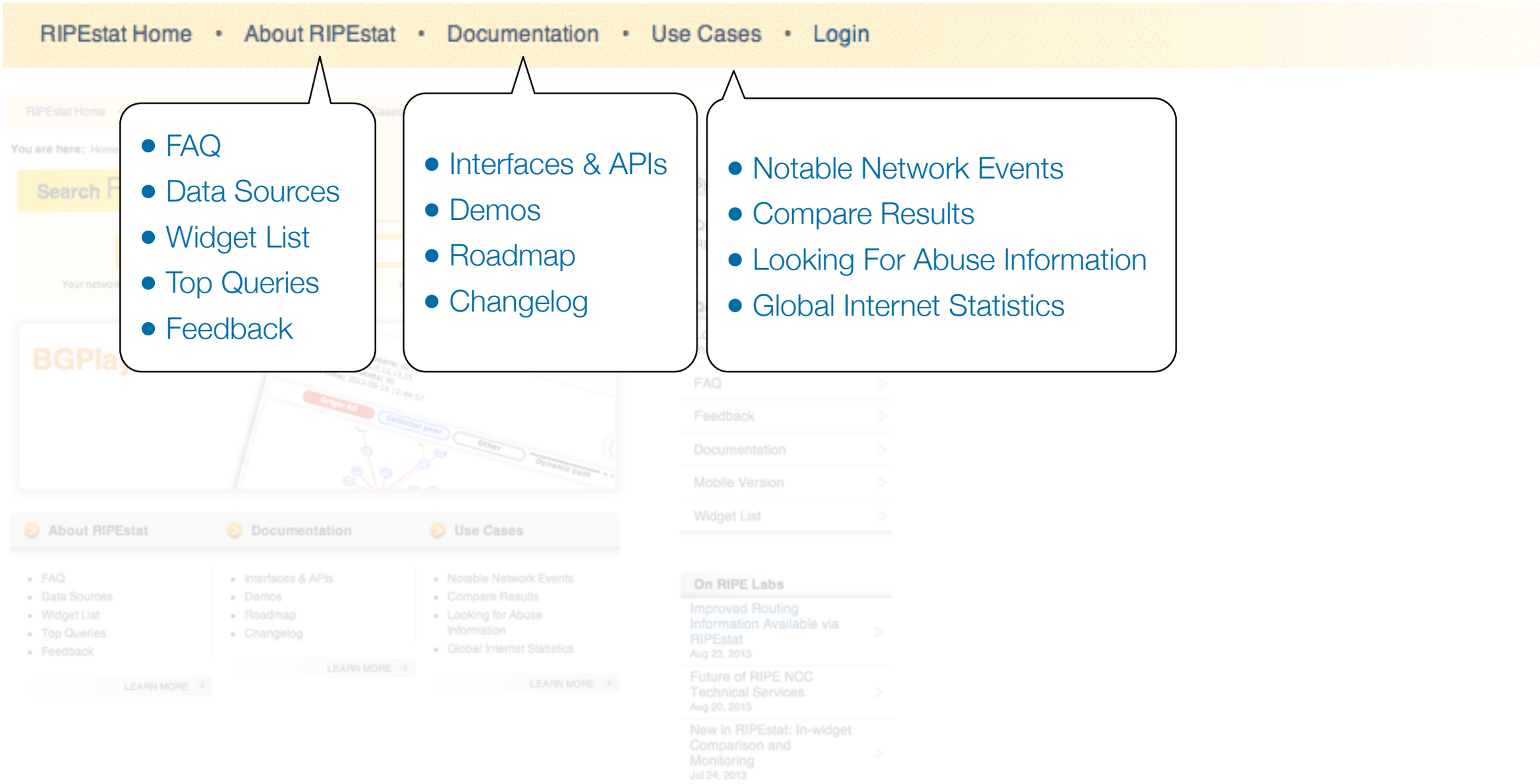
RIPEstat Web

- Finding information on RIPEstat



RIPEstat Web Interface

- Information structure on RIPEstat

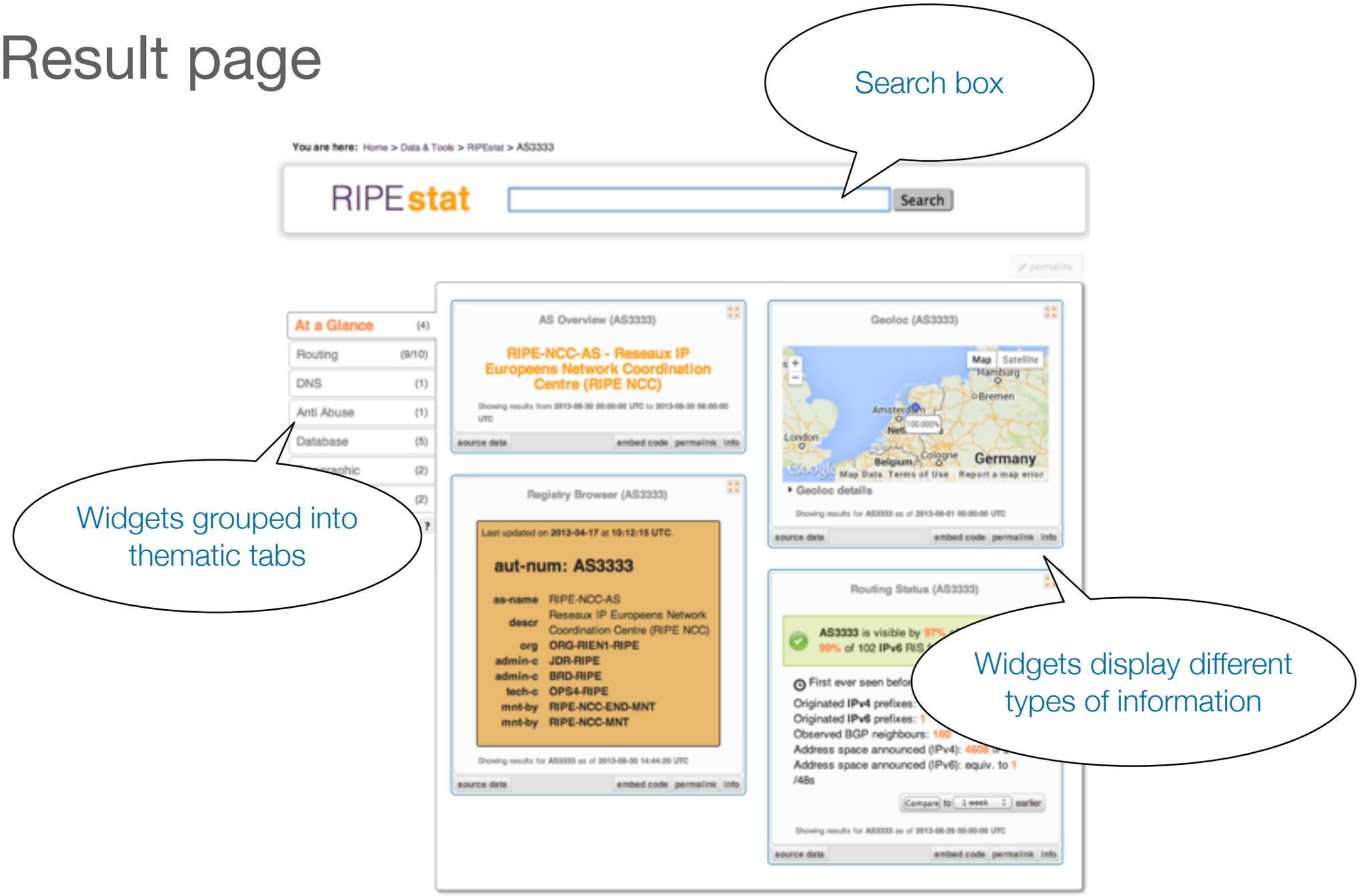


1.Querying for a Resource (Web)

- Task: Enter “AS333” in the search box

1.Querying for a Resource (Web)

- Result page

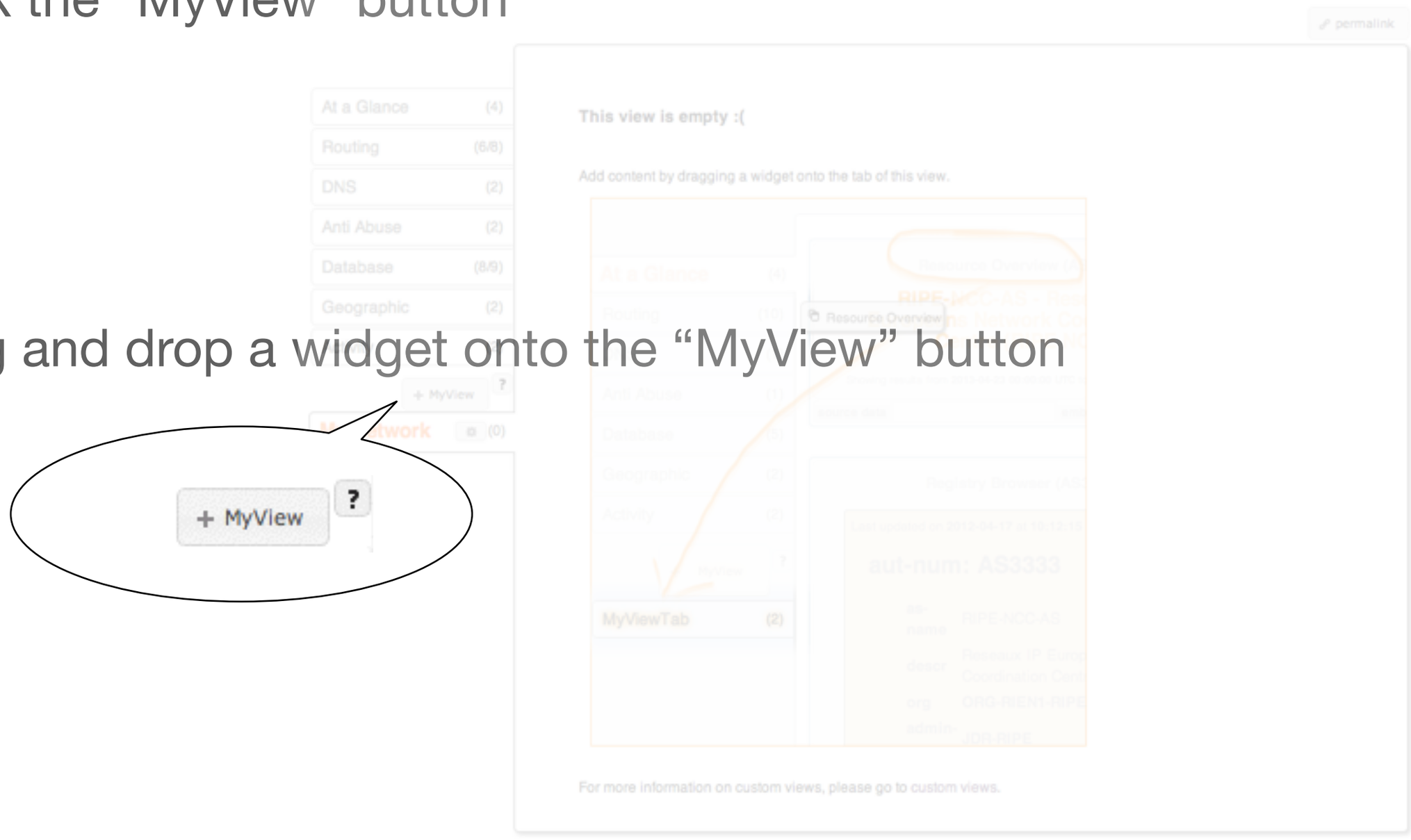


1.Querying for a Resource (Web)

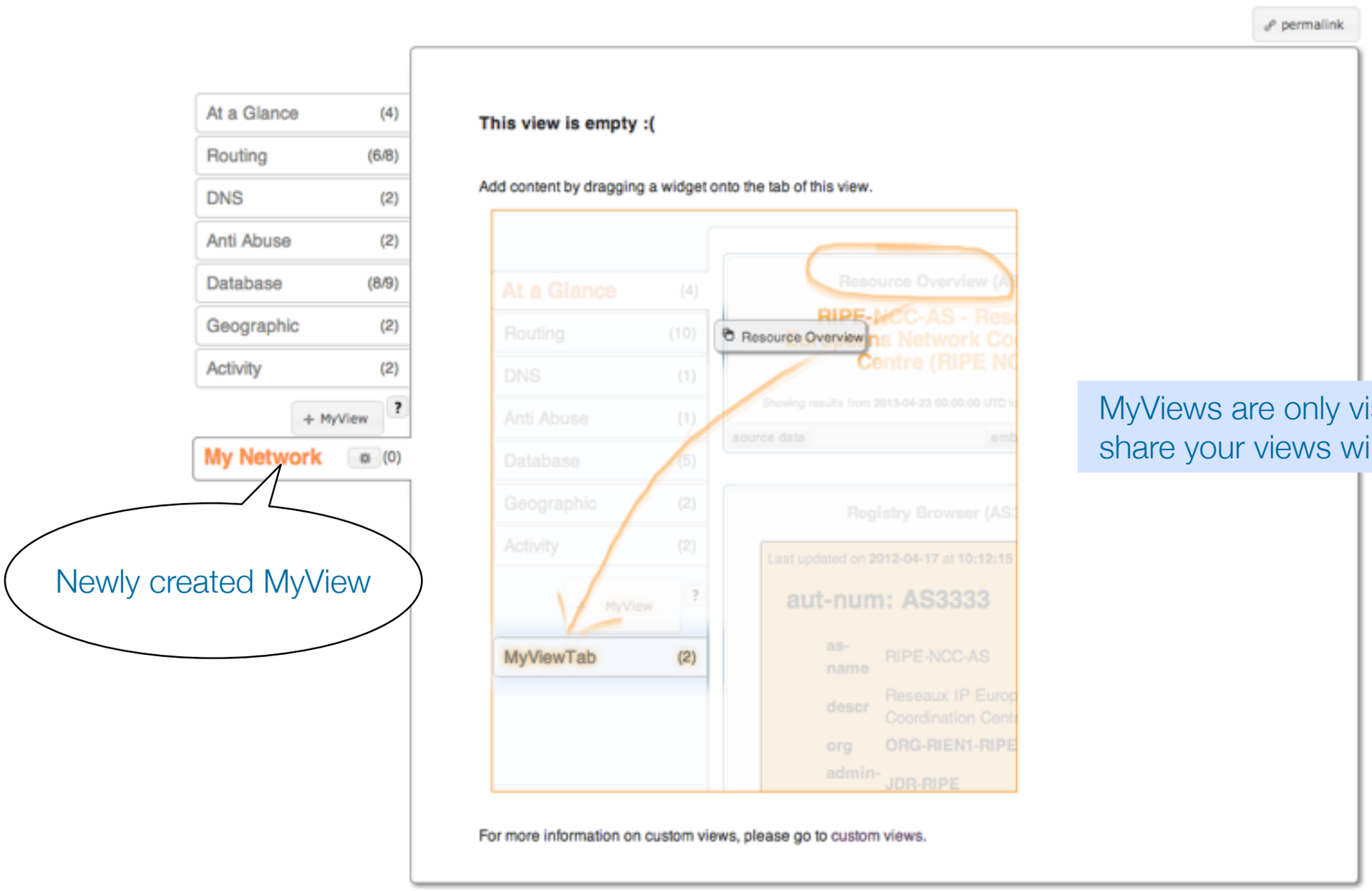
- Tasks
  - What network announces 140.78.50.90?
  - Is 193.3.4.2 routed?
  - In which country is 91.229.42.0/23 used?
  - What is its corresponding INETNUM object?
  - What widget provides real-time routing status?
  - By what percent did the number of prefixes announced within Poland increased over the last two years?
  - How would you share interesting network events with a colleague?

2.MyViews (Web)

- Create custom views
  - Click the “MyView” button
  - Drag and drop a widget onto the “MyView” button



2.MyViews (Web)



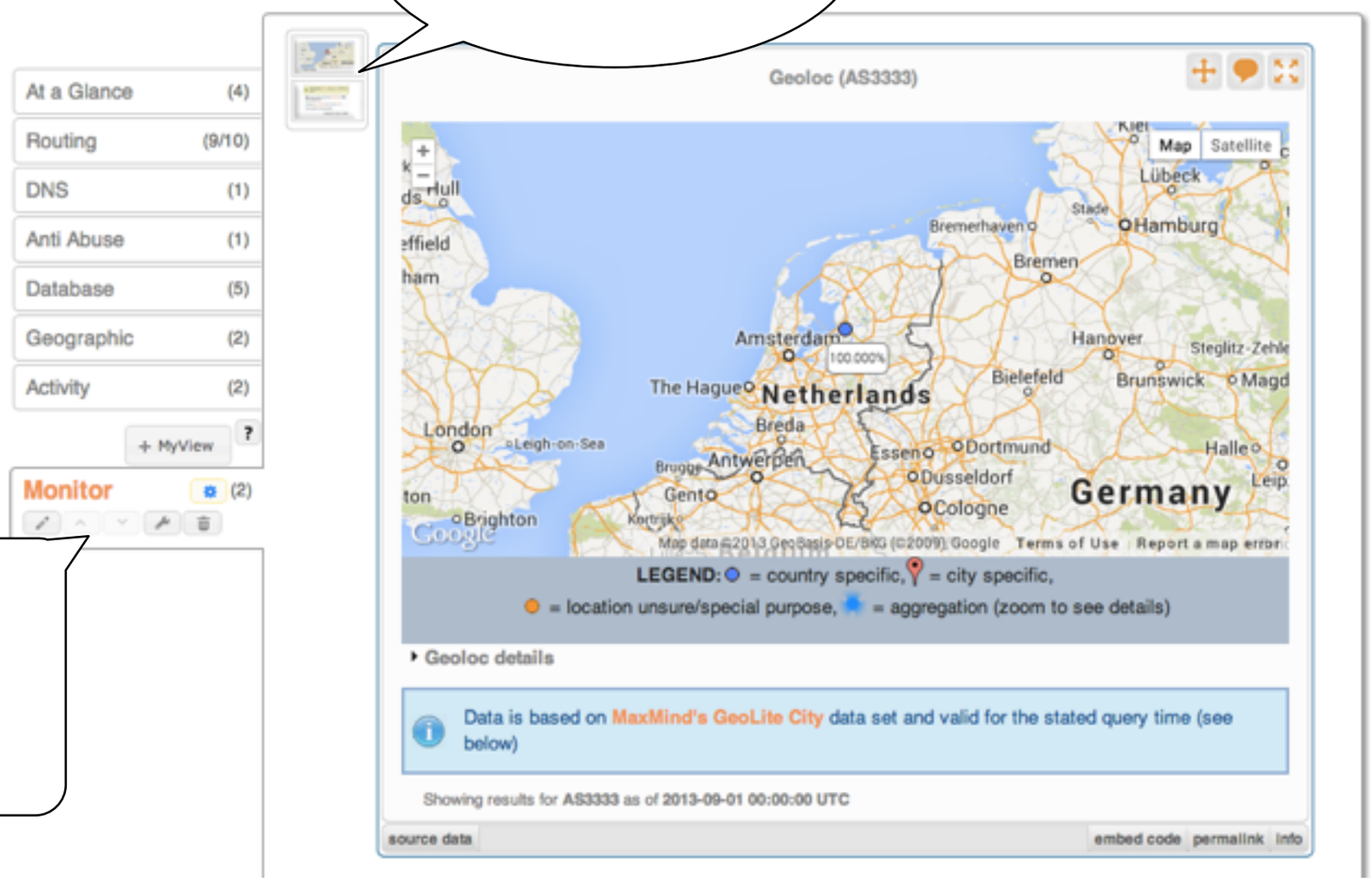
Newly created MyView

MyViews are only visible to you. An option to share your views will be available soon!

2.MyViews (Web)

- Customise MyViews

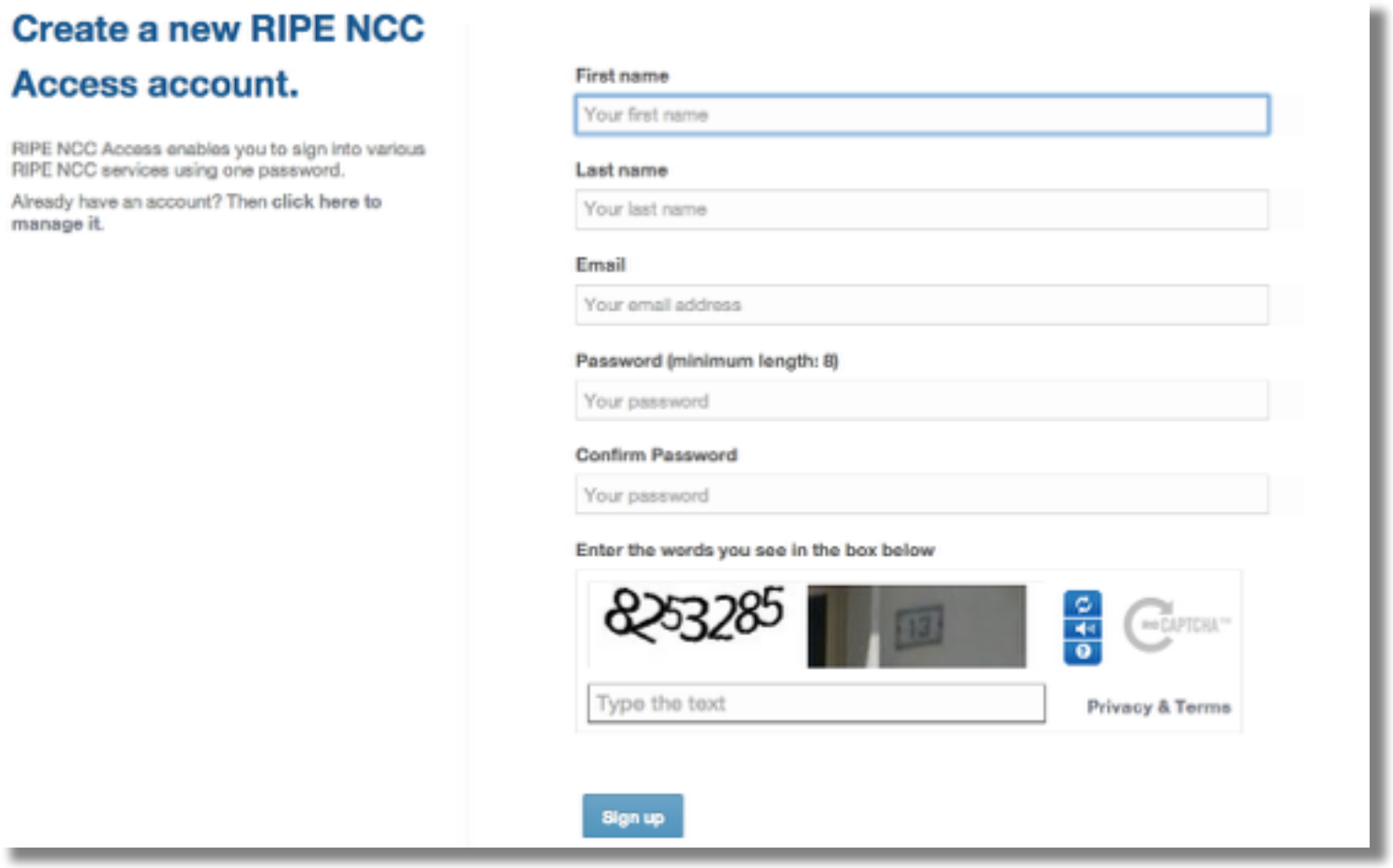
Re-order widgets as you like



- Rename
- Re-order
- Control visibility
- Remove

Create SSO Account

- Tasks
  - Go to “https://stat.ripe.net” and click on “Login”
  - “…click here to create one.”

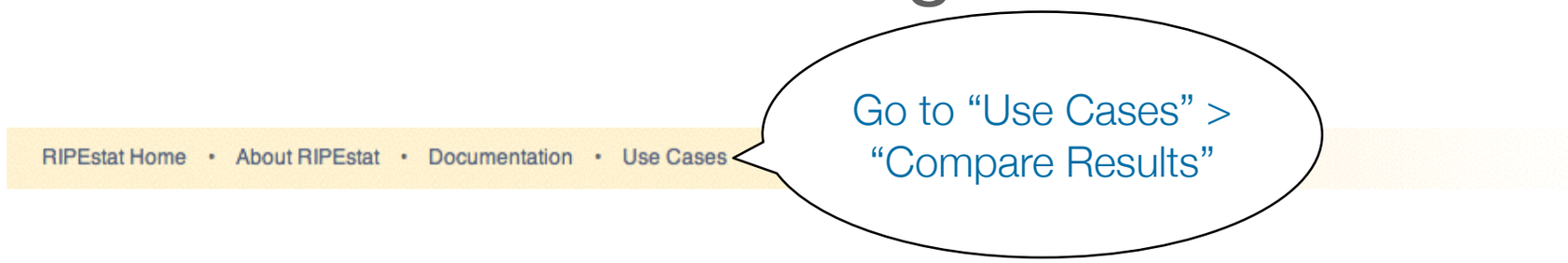


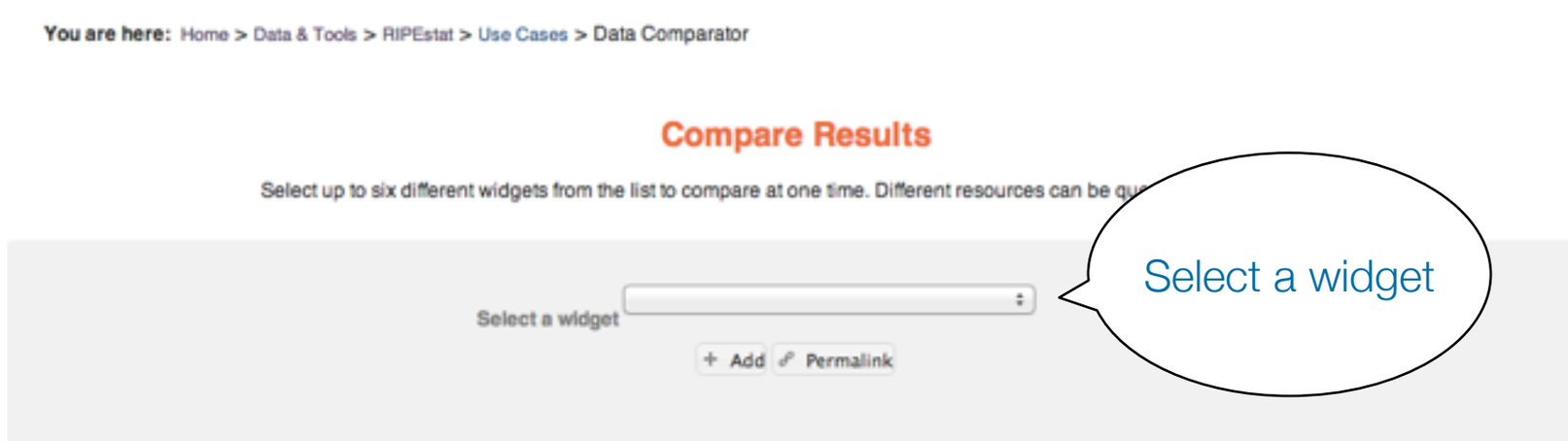
2.MyViews (Web)

- Tasks
  - Create a MyView for a prefix containing the following widgets:
    - Routing Status
    - Looking Glass
    - Routing History
  - Create another MyView with a least two widgets and give it a meaningful name

3.Compare Resources (Web)

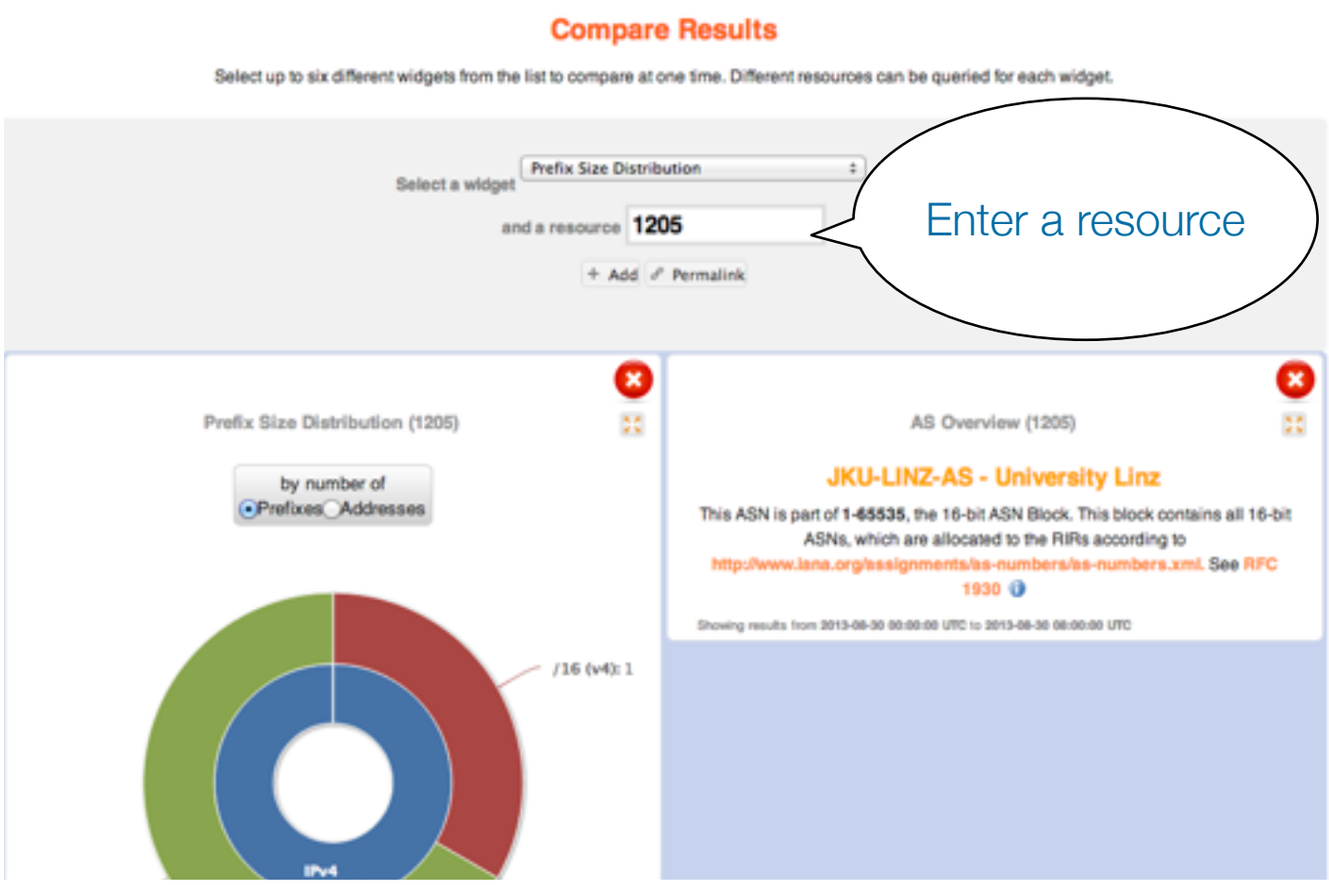
- Compare results in different widgets





3.Compare Resources (Web)

- Compare results in different widgets
  - Select the “Prefix Size Distribution” widget
  - Enter “AS1205”



3.Compare Resources (Web)

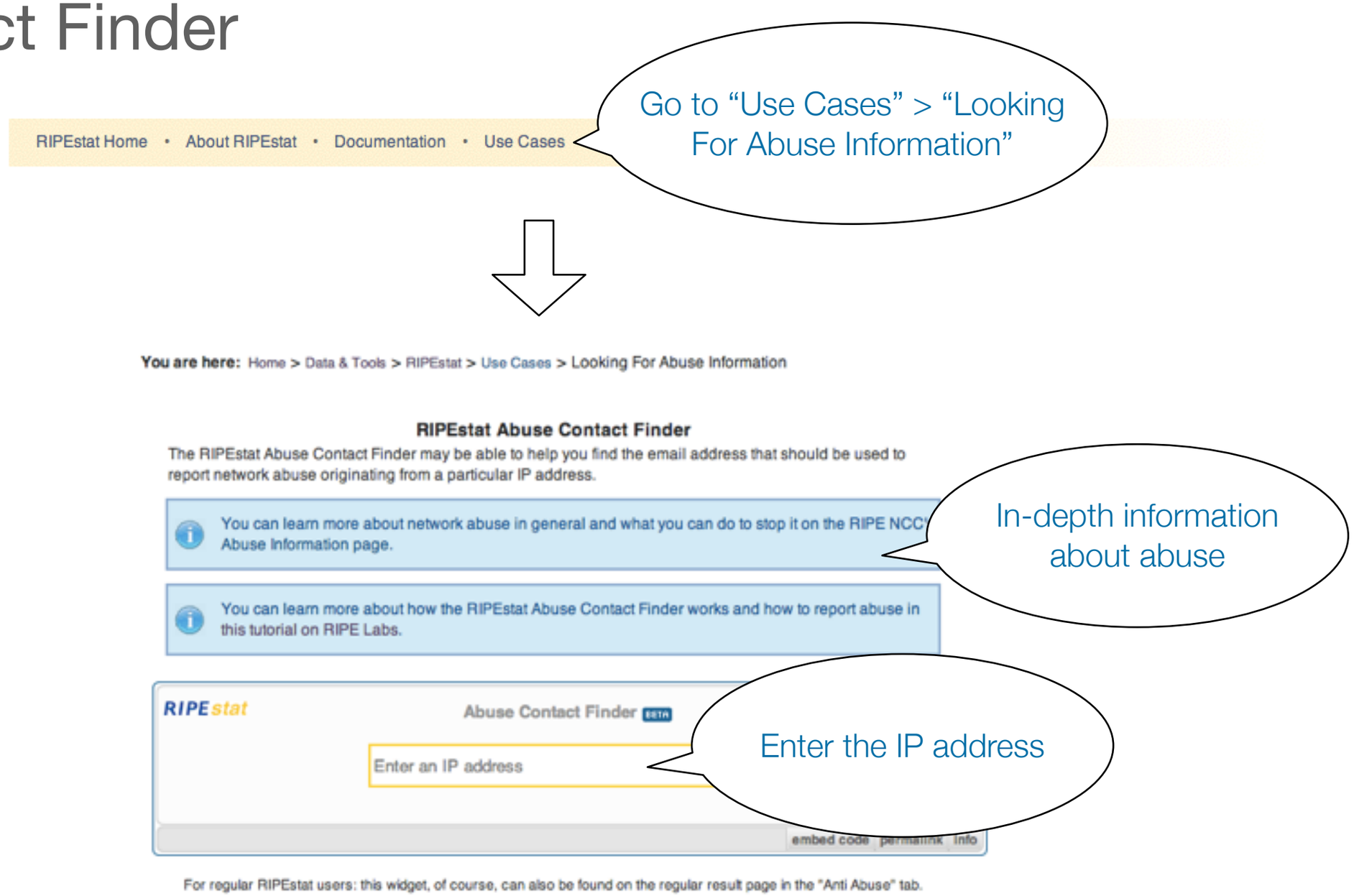
- In-widget comparison
  - Country Routing Statistics

3.Comparing Resources (Web)

- Tasks
  - Compare the number of announced prefixes for two networks over the past two years using the widget comparison page
  - How does the Internet in Poland compare to the UK? Use in-widget comparison!

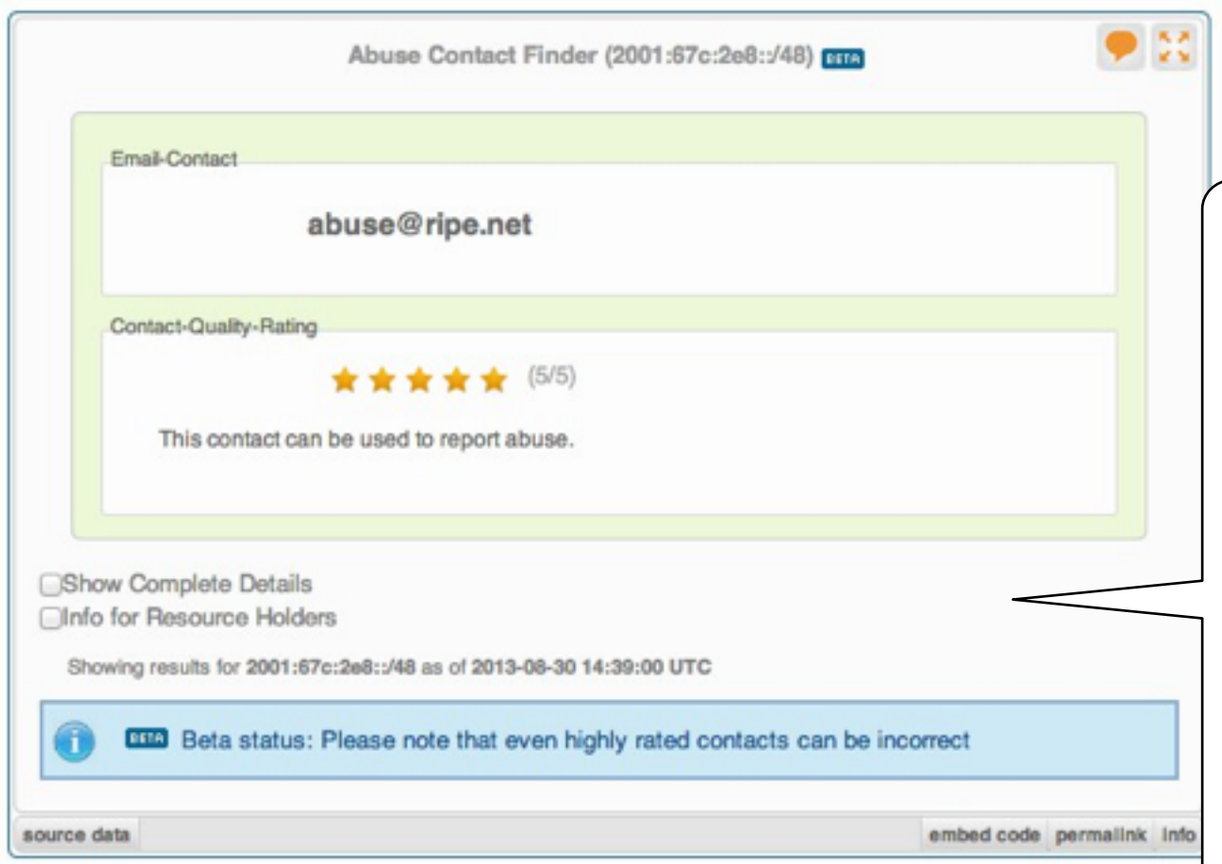
4.Handling Abuse (Web)

- Take action in an abuse case with the Abuse Contact Finder

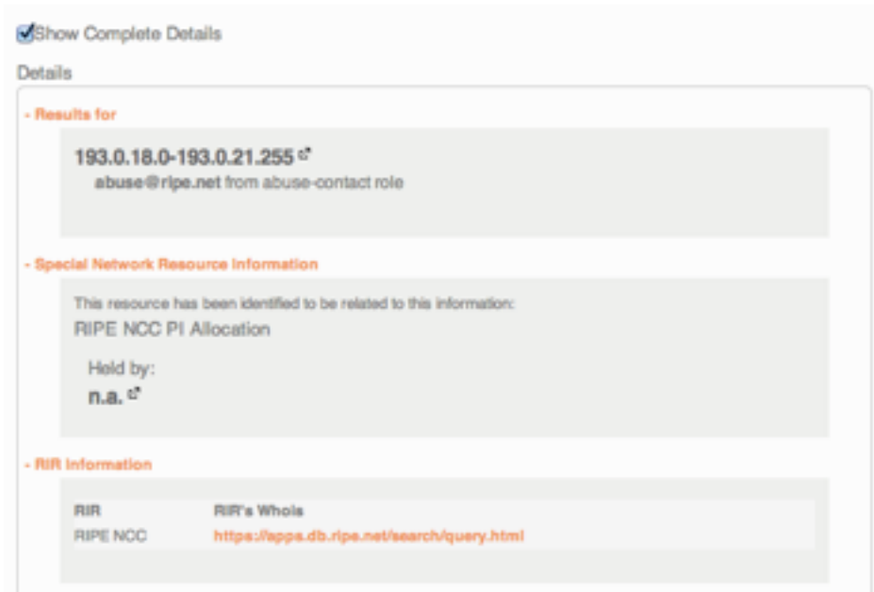


4.Handling Abuse (Web)

4.Handling Abuse (Web)



Details about the resource and abuse contact:



4.Handling Abuse (Web)

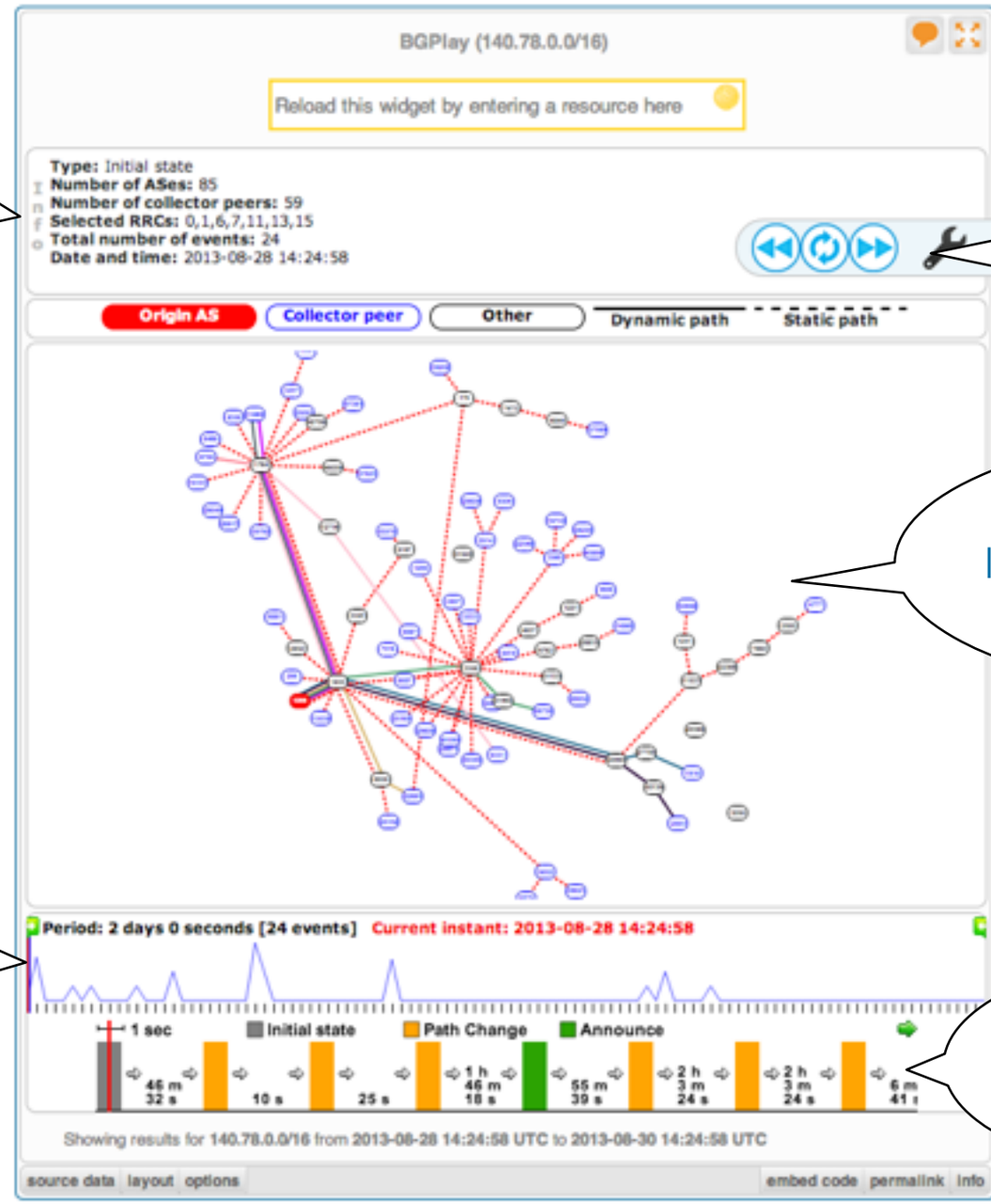
- Tasks
  - What is the abuse contact for 193.0.20.22 or the hotel network?
  - Check an IP address from your home network
  - **Discussion**:
    - What can you do in these cases?
      - No abuse contact found
      - No response on an abuse report

5.Let's BGPlay! (Web)

- Use BGPlay to see how your network is routed
  - BGPlay is a tool that show the routing state in an animated and highly-interactive manner
  - Go to: https://stat.ripe.net/widget/bgplay

5.Let's BGPlay! (Web)

BGP event, ASN or ASN path details



Control panel:

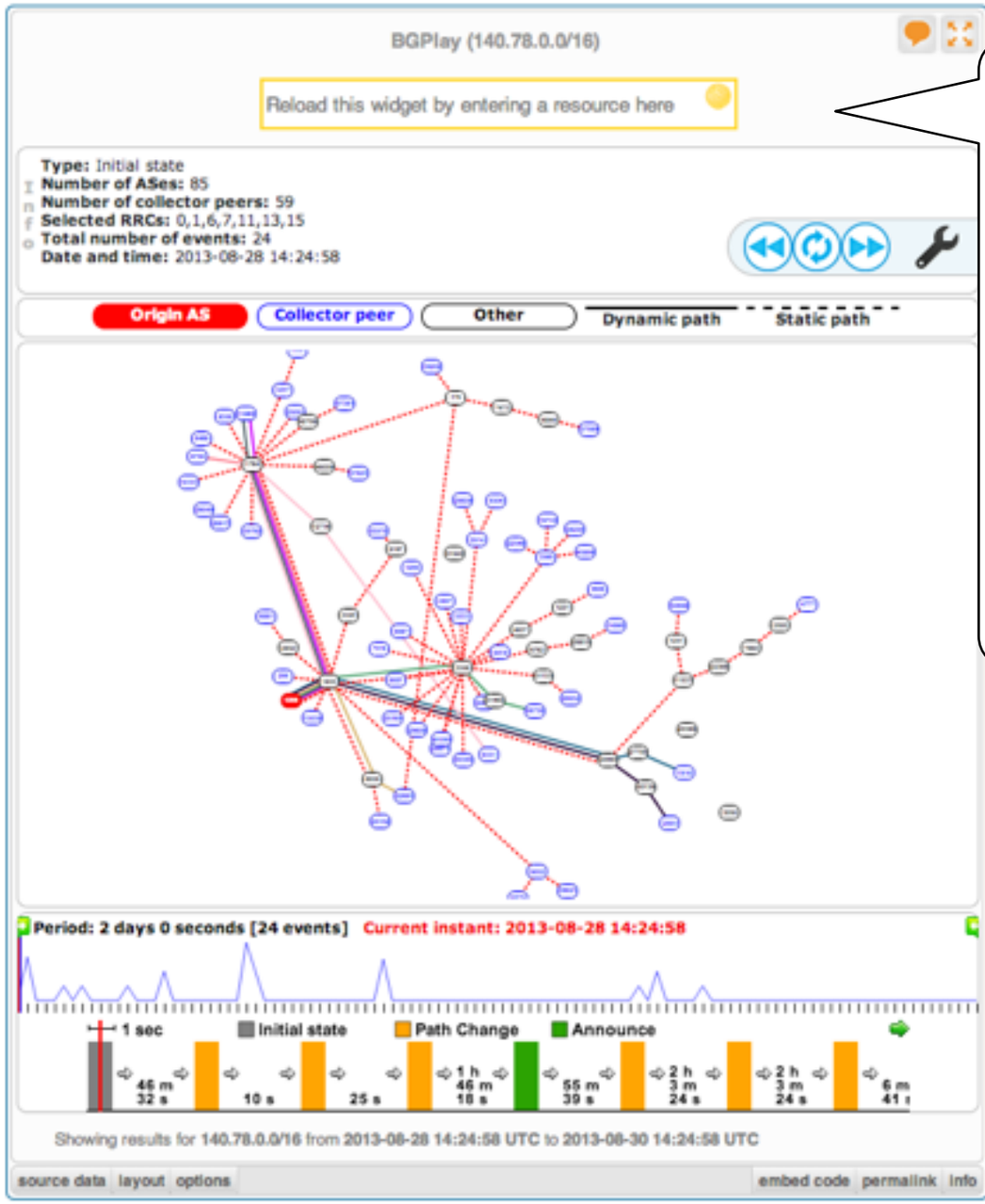
- Covered time period
- RRC selection

Interactive graph visualisation

Control timeline

Selection timeline

5.Let's BGPlay! (Web)



Examples:

- Prefix with announcements & withdrawals: 84.205.64.0/24
- Check IPv6 connectivity: 2001:67c:2e8::/48
- Multi-homed prefix: 199.7.80.0/24

5.Let's BGPlay! (Web)

- Task
  - Find the up-stream provider for AS1205
  - Is AS3333 multi-homed?
  - Check the IPv6 connectivity of your own network

RIPEstat

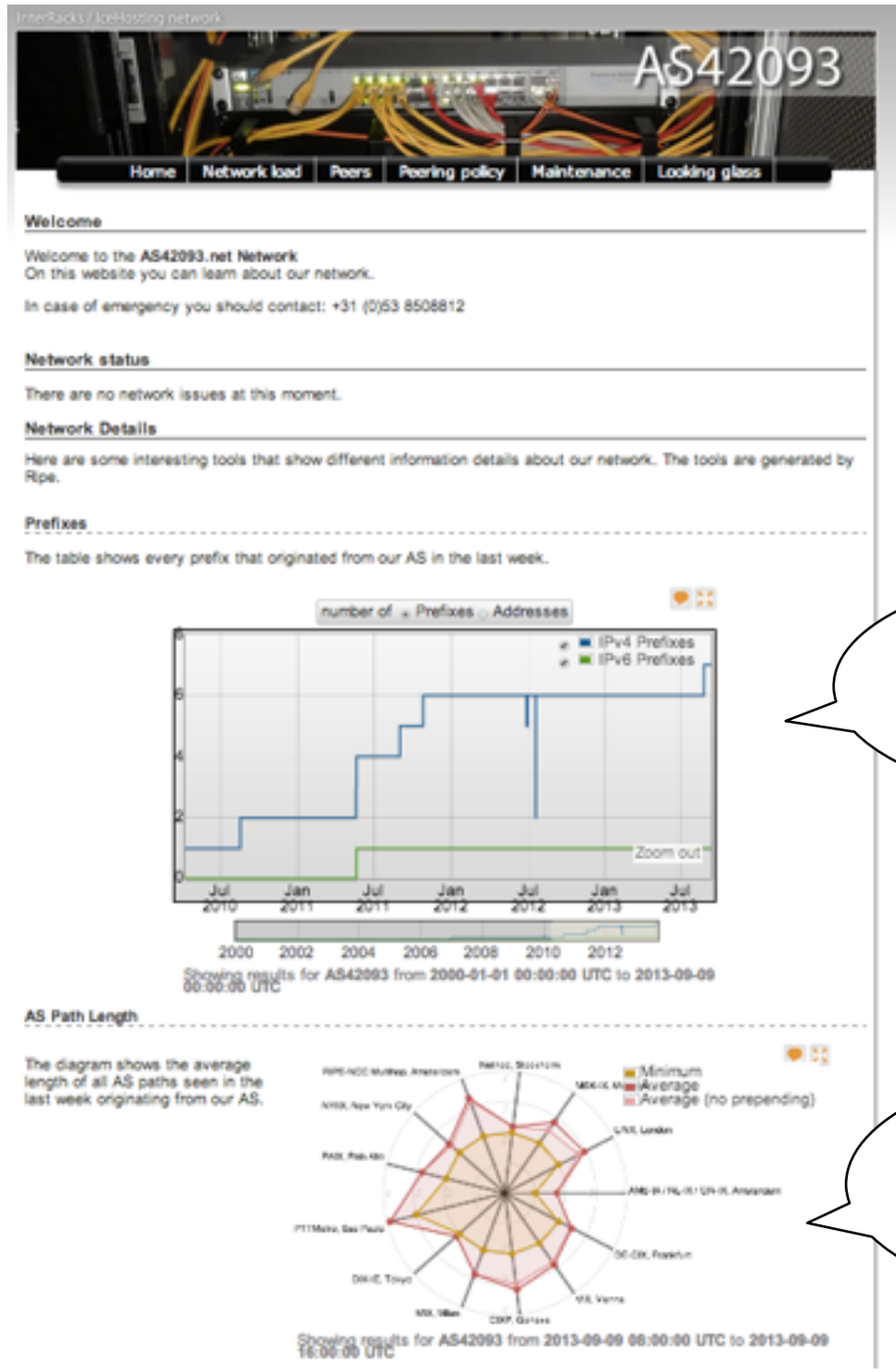
Advanced

6.Embedding Widgets On Your Site

- Visualising raw data
  - What is the concept?
    - The RIPEstat Widget API uses the RIPEstat Data API (or any other RESTful-API) to create visualisations helping to make the data more understandable
    - Build on top of open web standards (HTML, CSS, Javascript)
    - RIPEstat widget API documentation: https://stat.ripe.net/docs/widget_api

6.Embedding Widgets On Your Site

This ISP embedded widgets on its page.



Prefix Count widget

AS Path Length widget

6.Embedding Widgets On Your Site

- Task
  - Create a simple dashboard page to monitor your network
    - Create a simple HTML page
      - Download the sample page: https://stat.ripe.net/widgets/demo/widget_home.html
    - Embed three widgets of your choice
    - Make the widget smaller and remove the RIPEstat logo

```
ripestat.init(
        widget-type
        [, { loading-parameters } ]
        [, html-element-id ]
        [, { styling-parameters } ]
        [, load-callback() ]
)
```

7.RIPEstat Data API

- Using raw data output
  - What is the concept?
    - The RIPEstat Data API provides the lowest level of access to data. This data can be fed into custom applications or just used for scripting.
    - RIPEstat data API documentation: https://stat.ripe.net/docs/data_api

7.RIPEstat Data API

- Tasks
  - Use your browser to retrieve all announced prefixes for AS6714

7.RIPEstat Data API

- Tasks
  - A simple check on a resource of your choice if it is seen on the Internet
    - Create a simple script using resource-overview or routing-status https://stat.ripe.net/widgets/demo/script_me.html

```
var prefix = "140.78/16";
var dataAPIUrl = "https://stat.ripe.net/data/prefix-overview/data.json?resource=" + prefix;
jQuery.ajax({
    url: dataAPIUrl,
    error: function() {
        alert("error");
    },
    success: function( response ) {
        alert("success");


        // get announcement status
        var aStatus = response["data"]["announced"];

        // display result
        var container = jQuery("#announcement-status");
        container.html(prefix + " is announced: " + aStatus);

    },
    dataType: "jsonp"
});
```

9.Create a Nagios Check

- Create a Nagios check using the RIPEstat Data API
  - Nagios is a monitoring tool that supports the development of custom checks (like other monitoring tools)
  - Result codes for a check show the state:

State	Result Code
Ok	0
Warning	1
Error	2

9.Create a Nagios Check

Example of a Python based check:

```
if args.transit:
    transit = args.transit.split(',')
origin = args.origin.split(',')
nagios_status = 0
origin_errors = 0
transit_errors = 0
nagios_message = ""
url = "https://%s/data/looking-glass/data.json?resource=%s" % (args.statserver, urllib2.quote(args.prefix, ''))
lookingglass_raw = urllib2.urlopen(url)
lookingglass_json = json.load(lookingglass_raw)
if lookingglass_json['data_call_status'] != "supported":
    print "WARN: %s is under maintance " % (args.statserver)
    sys.exit(1)
for rrc in lookingglass_json['data']['rrcs']:
    for peer in lookingglass_json['data']['rrcs'][rrc]['entries']:
        aspath = peer['as_path'].split()
        details = peer['details'][0].split()
        peer_addr = details[0]
        nexthop = details[2]
        router_id = details[3]

        if len(aspath) > args.minpath:
            if aspath[-1]  not in origin :
                origin_errors += 1
                nagios_message = nagios_message + ( "Origin missmatch %s (%s): %s; " % (rrc, peer_addr, aspath[-1]))
            if args.transit:
                if aspath[-2]  not in transit :
                    transit_errors += 1
                    nagios_message = nagios_message + ( "Transit missmatch %s (%s): %s; " % (rrc, peer_addr, aspath[-2]))
```

```
if origin_errors == 0 and transit_errors == 0:
    nagios_message = "OK: %s Origin is %s " % (args.prefix, args.origin)
    if args.transit:
        nagios_message = "%s and all transits match %s" % (nagios_message, args.transit)
elif origin_errors >= args.crit or transit_errors >= args.crit:
    nagios_status = 2
    nagios_message = "ERROR: " + nagios_message
elif origin_errors >= args.warn or transit_errors >= args.warn:
    nagios_status = 1
    nagios_message = "WARN: " + nagios_message
```

Questions?