Firewall on Demand v1.5

New features supported

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Firewall on Demand – Introduction

- Firewall on Demand, abbreviated as FoD, is an application with a WEB front which allows subscribed users to disseminate firewall filters easily without any hassle.
- FoD's key features are:
  - Precision – specific malicious flows can be targeted
  - Speed - Time to disseminate/withdraw firewall filters is sub 10 seconds
  - Convenience - NREN users can use web portal themselves, or make request by phone or e-mail.
  - Simplicity - The web portal uses intuitive, non-vendor specific GUI-based wizard to configure router firewall filters.
  - No interaction* (e-mail, phone call) with GEANT NOC is required. NREN user can add/remove filters at its own discretion.
  - No special knowledge of router-language is required. The WEB based app offers a very friendly scheme for applying the filter.
- The magic of FoD is powered on by the cutting edge flowspec technology as described by the RFC 5575.

*NOC/CERT users can still contact GEANT CERT using the traditional methods to request blocking

Why Flowspec?

Speed

Effectiveness

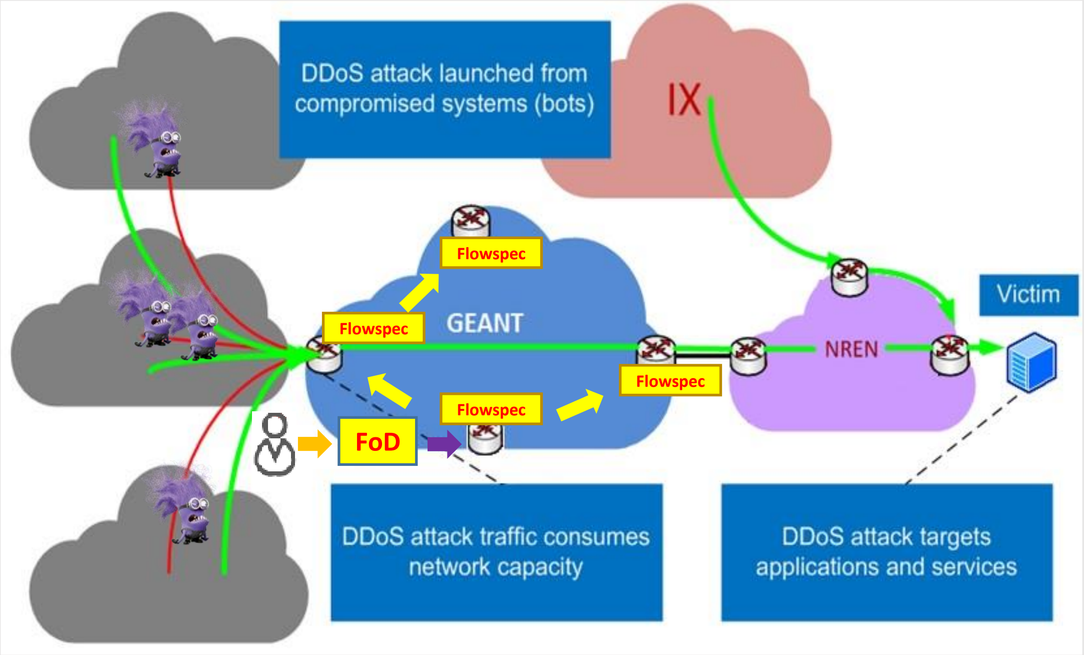
Efficiency

Why Firewall on Demand?

- Value add tool part of the NSHaRP service
- Easier audit of flowspec filters
- Easier removal (auto-expire)
- Cleaner traditional filters without "temp" terms that pile up with time
- Less tickets on the OTRS queue
- Reporting (to be supported)

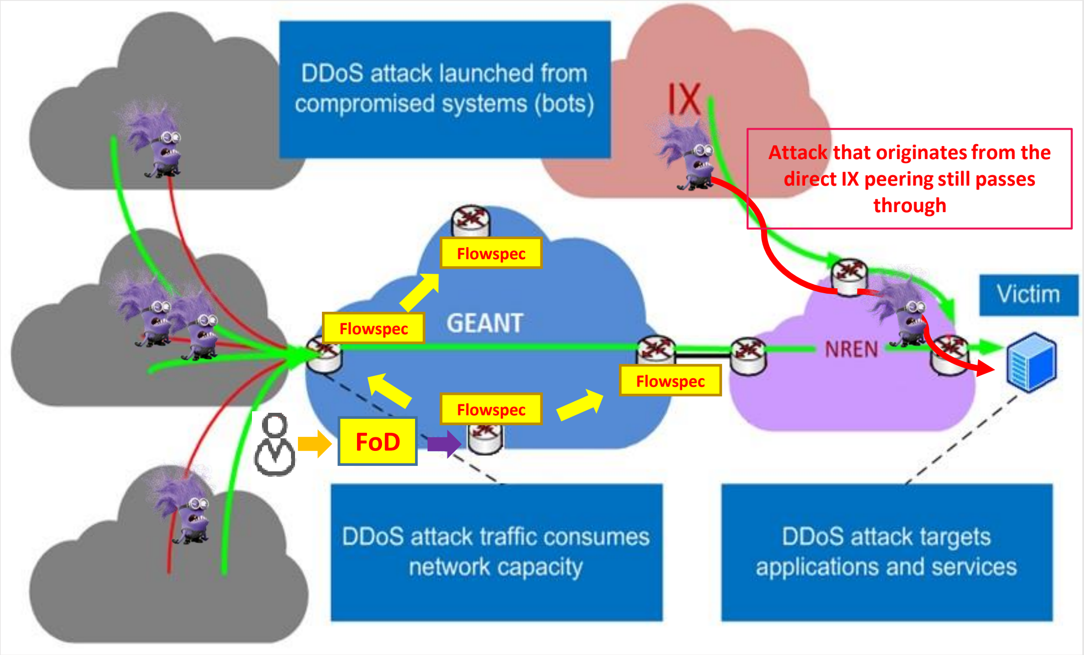
FoD Capabilities

- Propagate flowspec filters across GEANT network
- Filters CAN have DST address from YOUR administrative IP space
- Have an e-mail sent to yourself or ticketing system for tracking after rule submission/edit/withdrawn
- Historical record – users can view all rules (active and de-activated) created by themselves or their colleagues


DDoS attack launched from compromised systems (bots)
IX
Flowspec
Flowspec
GEANT
Victim
NREN
Flowspec
Flowspec
FoD
DDoS attack traffic consumes network capacity
DDoS attack targets applications and services

Requirements, Constraints and Limitations

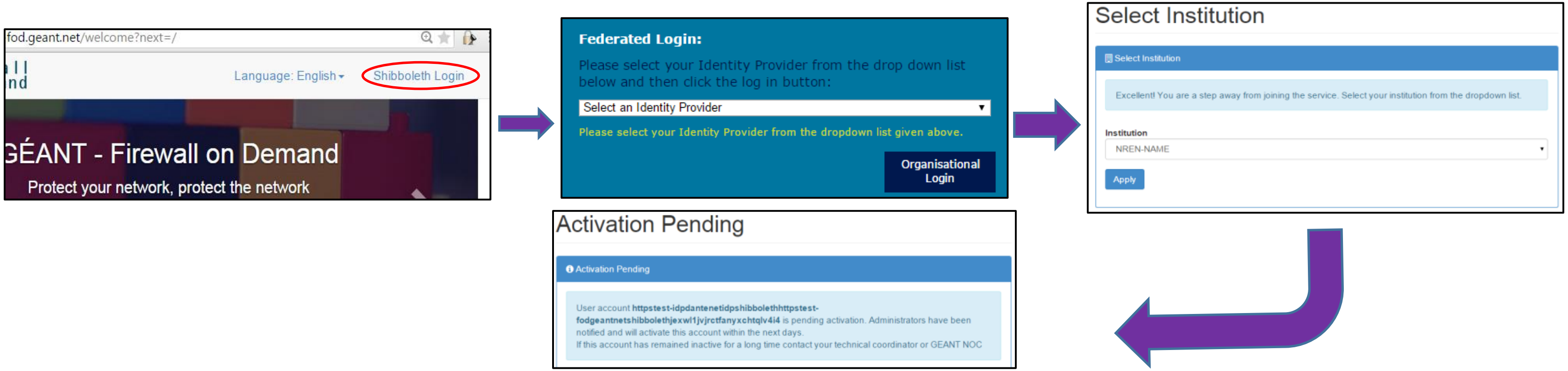
- Only affects flows transiting GÉANT core routers
- IPv6 is not currently supported
- Propagate a filter with a DST subnet bigger than /29
- Access FoD platform from an IP space other than your NOC’s/GEANT network’s space


DDoS attack launched from compromised systems (bots)
IX
Attack that originates from the direct IX peering still passes through
Flowspec
Flowspec
GEANT
Flowspec
Flowspec
FoD
NREN
Victim
DDoS attack traffic consumes network capacity
DDoS attack targets applications and services

How to access UAT FoD

All GÉANT member NRENs may subscribe. The subscription process is as follows:

1. NREN APM completes form on https://partner.geant.org/sites/main/Pages/fod-request.aspx or contacts partner-relations@geant.org if issues
2. Authorized NREN user, using host in NOC subnet, accesses https://fod.geant.net and clicks at “Shibboleth Login” button. Log in using standard eduGAIN method.
3. New user’s account will be activated within 1 business day or less (assuming login details match info provided by APM)


fod.geant.net/welcome?next=/
Language: English
Shibboleth Login
GÉANT - Firewall on Demand
Protect your network, protect the network

Federated Login:

Please select your Identity Provider from the drop down list below and then click the log in button:

Select an Identity Provider ▾

Please select your Identity Provider from the dropdown list given above.

Select Institution

Excellent! You are a step away from joining the service. Select your institution from the dropdown list.

Institution: NREN-NAME ▾

Activation Pending

User account **httpstest-idpdantenetidpshibbolethhttpstest-fodgeantnetshibbolethjexwl1jvjrctfanyxchtqlv4i4** is pending activation. Administrators have been notified and will activate this account within the next days.
If this account has remained inactive for a long time contact your technical coordinator or GEANT NOC

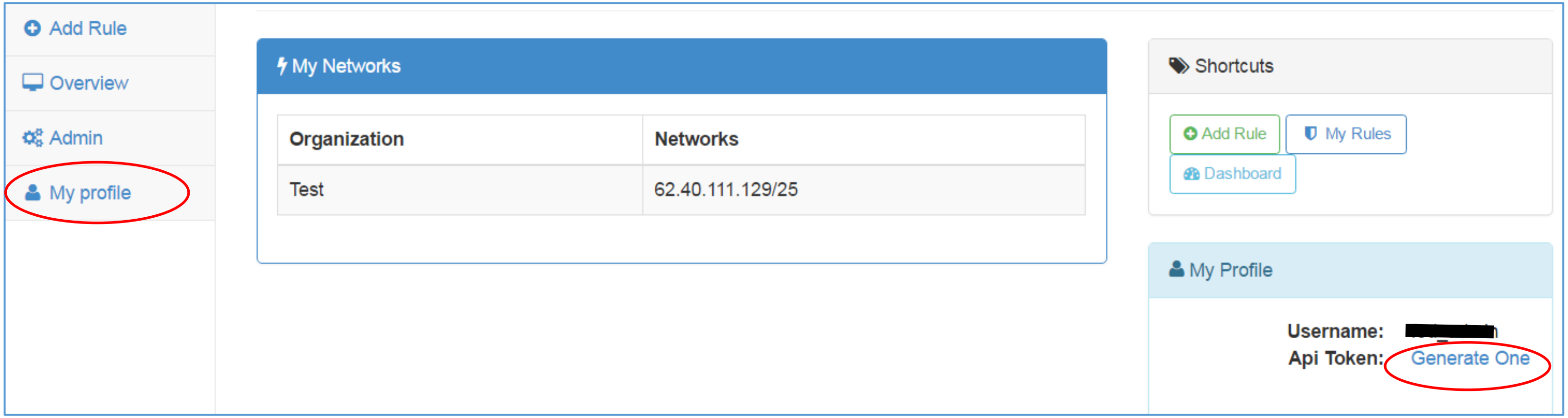
Shibboleth Attributes

- FoD’s Shibboleth module requires the release of the following attributes:

- givenName
- Mail
- Persistent-id
- principalName
- Surname
- UniqueID

REST API – Token creation

- API Token Creation Process
  - Click on the “My Profile” tab and then from the right side click “Generate one” next to Api Token.
  - You will use that token in order to make calls to the REST API
  - Don’t worry about losing that token once generated. It will always be there.
    - <u>However, keep it safe from “shoulder surfers”</u>



Organization	Networks
Test	62.40.111.129/25

Username: [redacted]
Api Token: Generate One

REST API – Reading rule examples with curl

- Reading all rules
  - curl -X GET https://prod-fod.geant.net/api/routes/ -H 'Authorization: Token <your token>’ | python –mjson.tool
- Reading specific rule with ID of 1 (ID can be retrieved from above query)
  - curl -X GET https://prod-fod.geant.net/api/routes/**1**/ -H ‘Authorization: Token <your token>’ | python –mjson.tool

REST API – Deleting a rule example with curl

- Deleting a specific rule with ID of 18
  - curl -X **DELETE** 'https://prod-fod.geant.net/api/**routes**/**18**/' -H 'Authorization: Token <your token>‘| python –mjson.tool
  - Again, the ID of a rule can be retrieved by reading all rules with "curl –X GET.. From the example previously"
  - As always, the rule above now will enter the "deactivated" state, and not deleted. I.e. it will still be visible on your dashboard for later use if needed.

REST API – Submitting new rule requirements

- Submitting a new rule requires that first we have defined protocols, and “then actions” at minimum
  - Some ports, protocols and “then actions” are already defined. Let’s see which protocols are defined:

```
curl -X GET  https://prod-fod.geant.net/api/matchprotocol/ -H 'Authorization: Token
xxxxxxxxxxxxxx' |  python -mjson.tool
[{
        "id": 1,
        "protocol": "icmp"
    },
    {
        "id": 2,
        "protocol": "tcp"
    },
    {
        "id": 3,
        "protocol": "udp"
 }]
```

As you can see, ICMP, TCP and UDP protocols are defined. Those are enough for most of the attacks we know.

REST API – Submitting new rule requirements

- Finally let us see what are the defined “then actions” already in place:

```
 curl -X GET  https://prod-fod.geant.net/api/thenactions/  -H 'Authorization: Token xxxxxxxxx' |  python -
mjson.tool
  [    {
          "action": "discard",
          "action_value": "",
          "id": 3
      },
      {
          "action": "rate-limit",
          "action_value": "10000k",
          "id": 27
      }]
```

- If we want to add new action of rate-limit 1k:

```
curl -X POST  https://prod-fod.geant.net/api/thenactions/ -F "action=rate-limit" -F "action_value=1k" -H
'Authorization: Token xxxxx' |  python -mjson.tool
{
    "action": "rate-limit",
    "action_value": "1k",
    "id": 28
}
```

REST API – Wrapping it up all together

- We submit new rules using the POST method. Additionally, we must add more control to our flows by using foreign keys with the –F parameter. The required keys are the following:
  - Name
  - Source
  - Destination
  - Status (which have to be active when submitting new rule)
  - Then
  - Some optional keys are:
    - Comments
    - Protocol
    - Port
    - Destinationport
    - Sourceport

- Submitting a new rule:
  - Notice that “then” and “protocol” keys below take the whole path of the ID of the action and protocol. This is mandatory.

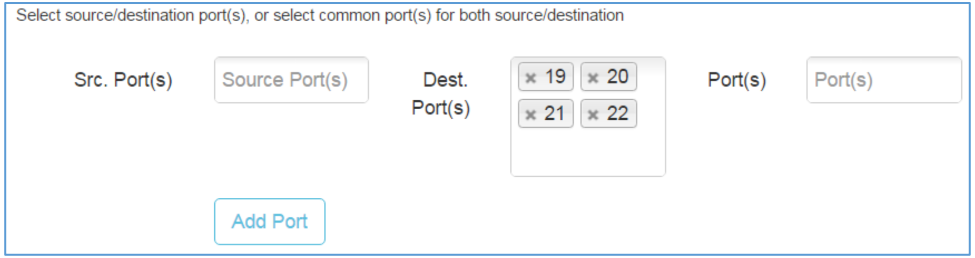
```
curl -X POST  https://prod-fod.geant.net/api/routes/ -F "comments=My first rule from REST"  -F
"source=10.100.10.4/32" -F "destination=192.168.1.5/32"  -F "name=Test1" -F "then=https://uat-
fod.geant.net/api/thenactions/27/" -F “destinationport=89" -F "protocol=https://uat-
fod.geant.net/api/matchprotocol/2/" -F "status=ACTIVE" -H 'Authorization: Token  xxxx' | python -
mjson.tool
```

REST API – Having issues with REST API?

- Don’t forget that:
  - Field “name” does not accept spaces
  - The trailing slash ‘/’ in the end of each field. E.g. https://prod-fod.geant.net/api/routes**/**
  - To put the CIDR notation on the source/destination fields
  - Field “status” has to take ACTIVE in capital

Multi-port Range Support

- Historically, FoD users have to insert ports one by one to form a range on the FoD GUI



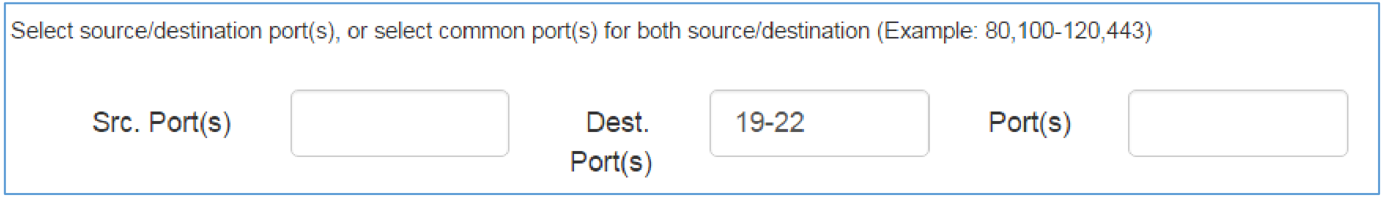
Select source/destination port(s), or select common port(s) for both source/destination

Src. Port(s) Source Port(s)

Dest. Port(s) × 19 × 20 × 21 × 22

Port(s) Port(s)

- Now, it is possible that one can insert ranges



Select source/destination port(s), or select common port(s) for both source/destination (Example: 80,100-120,443)

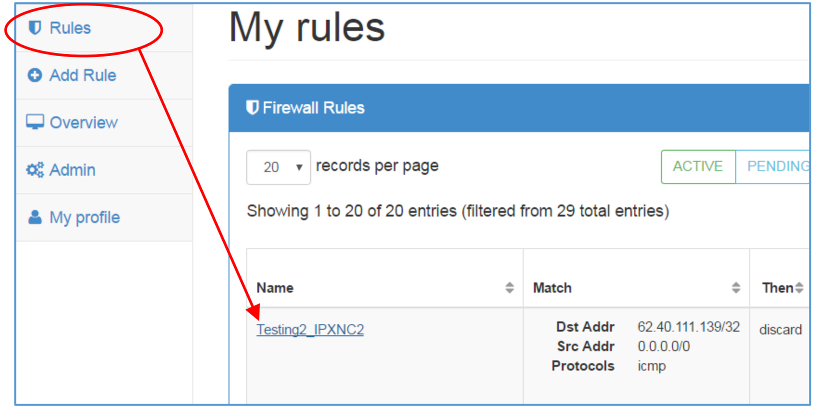
Src. Port(s)

Dest. Port(s) 19-22

Port(s)

Attack History Graph

- Now, it is also possible that one can see number of packets and bytes for a specific rule he applied.
- There are two views, absolute and relative depicting traffic for the last 60 minutes
- In order to see history graph, one would need to click on the “rule name” from within “Rules” tab



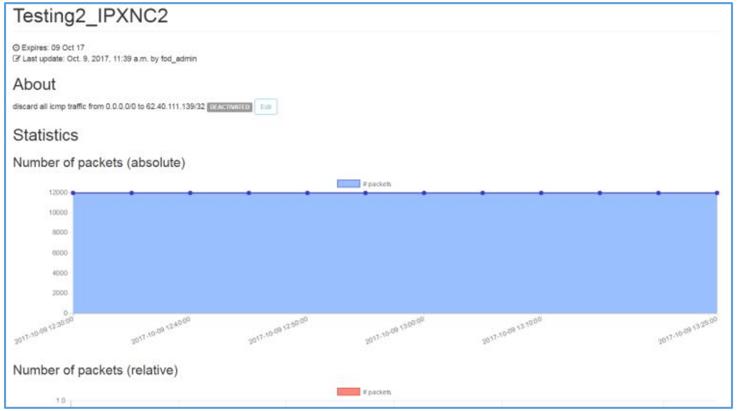
My rules

Firewall Rules

20 records per page

Showing 1 to 20 of 20 entries (filtered from 29 total entries)

Name	Match		Then
Testing2_IPXNC2	**Dst Addr** **Src Addr** **Protocols**	62.40.111.139/32 0.0.0.0/0 icmp	discard



Testing2_IPXNC2

Expires: 09 Oct 17
Last update: Oct. 9, 2017, 11:39 a.m. by fod_admin

About

discard all icmp traffic from 0.0.0.0/0 to 62.40.111.139/32 DEACTIVATED

Statistics

Number of packets (absolute)

Number of packets (relative)

How to Contact us

In case you have any issues or queries in relation to FoD, please contact GÉANT Infrastructure & Security team at **security@geant.org**