(APNIC Project)

Developing a Collaborative BGP Routing Analyzing and Diagnosing Platform

--The First Technical Committee Meeting

May 10, 2022

清華大學
Tsinghua University

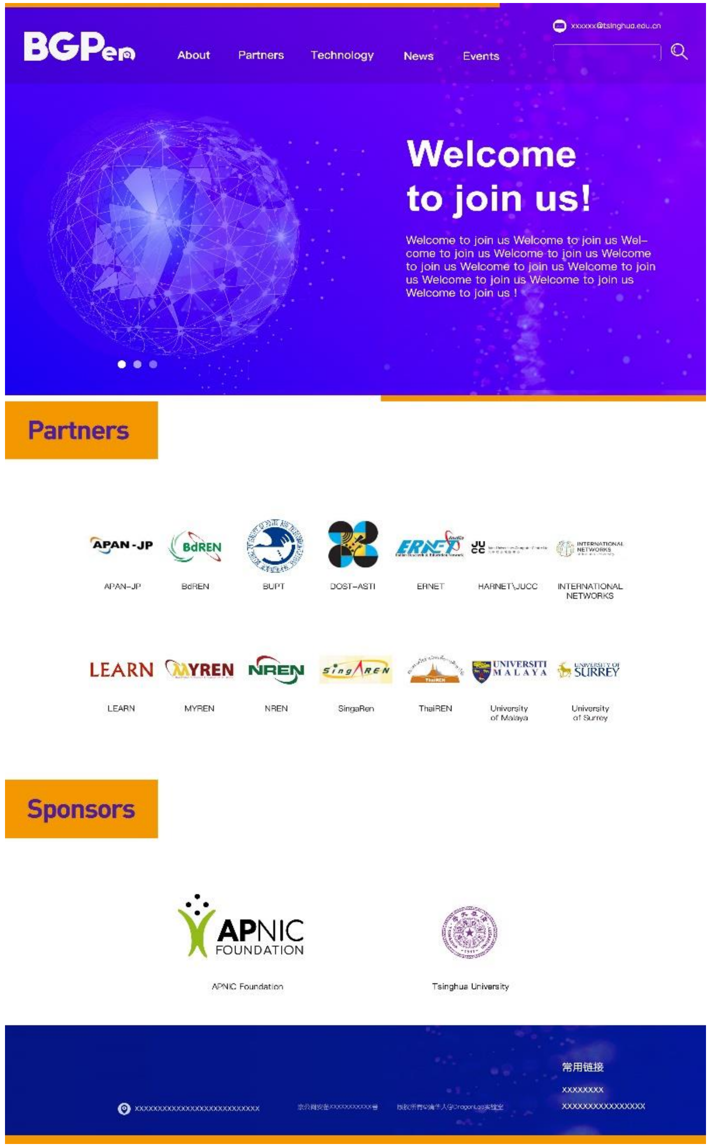
APNIC
FOUNDATION

Outline

- Overall work plan
- Detailed work plan for each part
  - Web site
  - BGP sharing
  - Looking Glass
  - Analyzing and Diagnosing Platform
  - Research Topic
  - Knowledge Sharing
- The outcome from the bilateral meetings(Technical Part)
- Security Concerns
- Comments/Suggestions

	Detailed Technical Committee Work Plan	Tentative Timeline
Timeline	Discussion on Timeline	May
Project Web Site	Requirements/Design	May
	Partner’s information	May
	Setting up project website	May
BGP Routing Information Sharing	Requirements/Design(email, slack)	May-June
	Document info (How to implement, what partners need to do)	May-June
	Implement the peering (meeting, email, slack)	May-June
Looking Glass Platform	Requirements/Design(email, slack)	June
	Document info (How to implement, what partners need to do)	June
	Implement the connection with LG platform(meeting, email, slack)	June
Hijack Detection and Mitigation	Problem and requirement sharing (meeting, email, slack)	June
	Confirm first stage functions	July
	Iterative feedback & development	July 2022 – July 2023
Research	Discussion on research topic, paper, technical document	July 2022 – July 2023
Knowledge Sharing	Any topic partners interested in , e.g. Problems, RPKI, BGPSEC, MANRS	regularly

Web Site Design



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xxxxxx@tsinghua.edu.cn

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to join us!

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Partners

APAN-JP BdREN BUPT DOST-ASTI ERNET HARNET\JUCC INTERNATIONAL NETWORKS

LEARN MYREN NREN SingaRen ThaiREN University of Malaya University of Surrey

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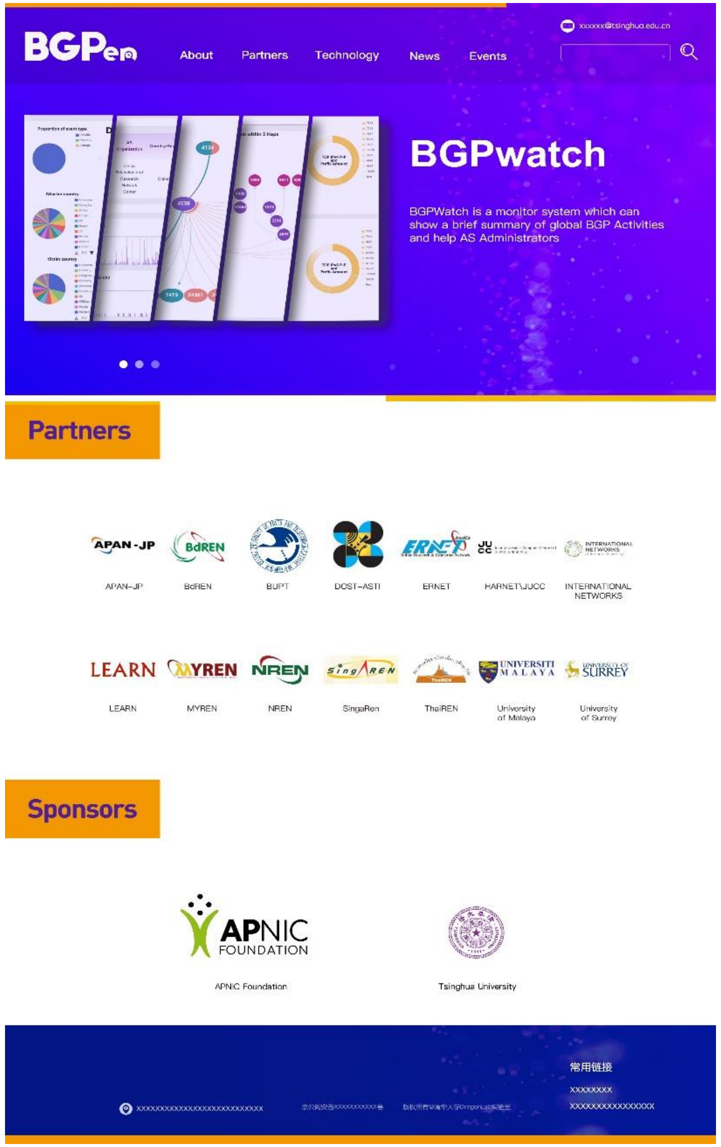

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BGPwatch

BGPWatch is a monitor system which can show a brief summary of global BGP Activities and help AS Administrators

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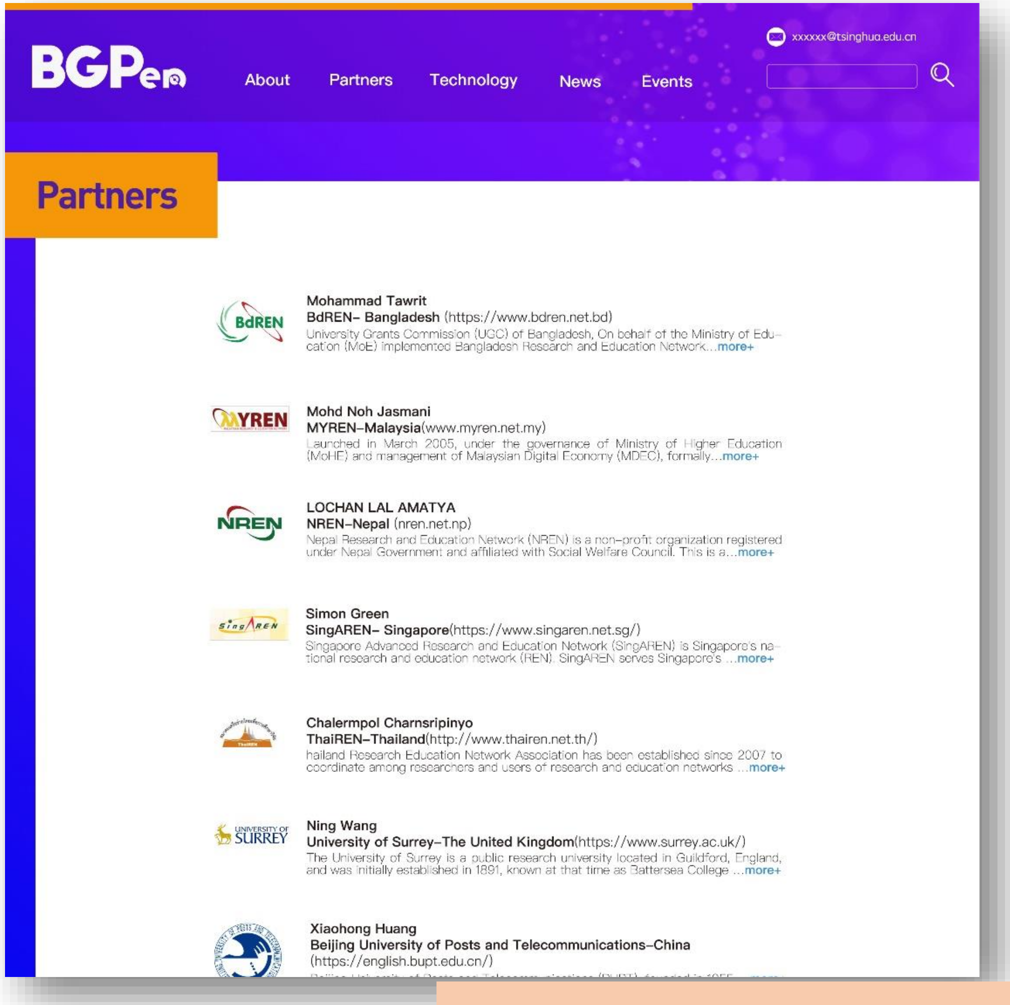
https://bgper.net

Partner’s Information in Web Site (Scheme 1)



Partners

Mohammad Tawrit
BdREN– Bangladesh (https://www.bdren.net.bd)
University Grants Commission (UGC) of Bangladesh, On behalf of the Ministry of Education (MoE) implemented Bangladesh Research and Education Network...more+

Mohd Noh Jasmani
MYREN–Malaysia(www.myren.net.my)
Launched in March 2005, under the governance of Ministry of Higher Education (MoHE) and management of Malaysian Digital Economy (MDEC), formally...more+

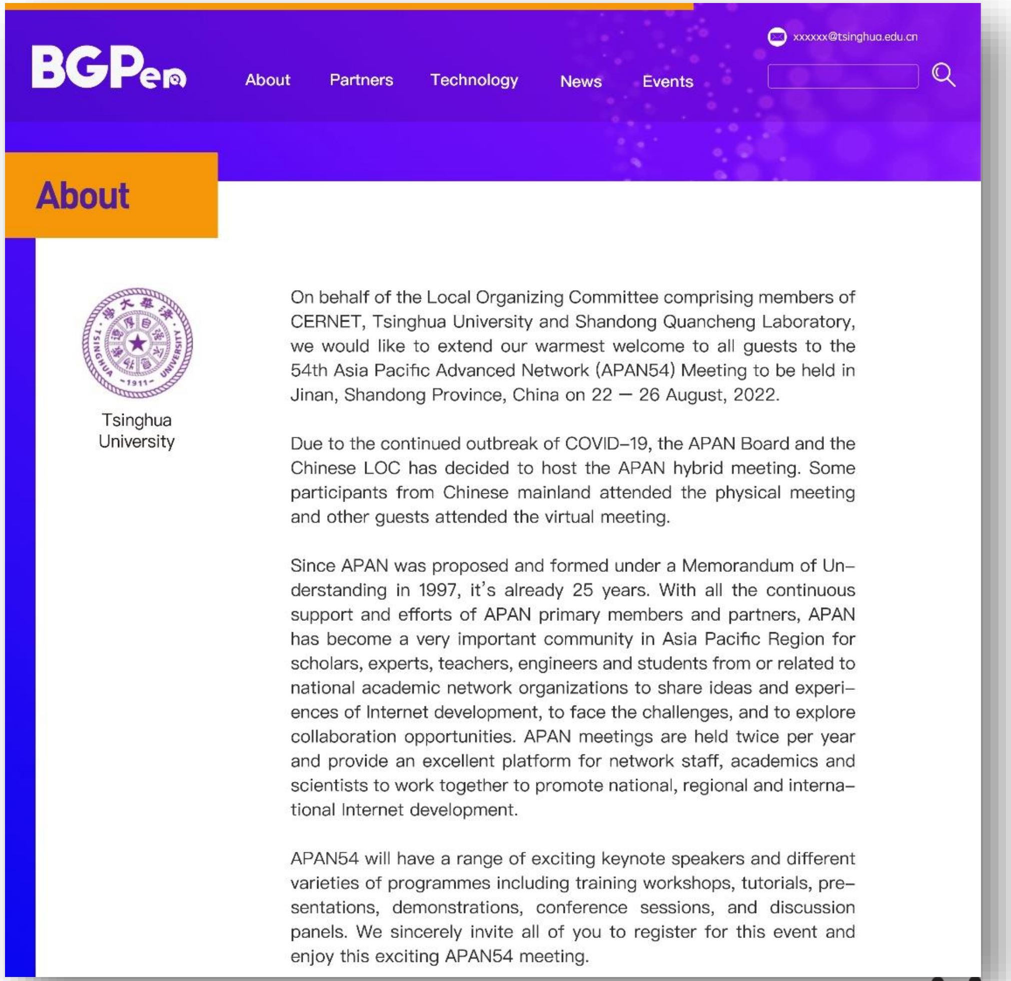
LOCHAN LAL AMATYA
NREN–Nepal (nren.net.np)
Nepal Research and Education Network (NREN) is a non–profit organization registered under Nepal Government and affiliated with Social Welfare Council. This is a...more+

Simon Green
SingAREN– Singapore(https://www.singaren.net.sg/)
Singapore Advanced Research and Education Network (SingAREN) is Singapore's national research and education network (REN). SingAREN serves Singapore's ...more+

Chalermpol Charnsripinyo
ThaiREN–Thailand(http://www.thairen.net.th/)
hailand Research Education Network Association has been established since 2007 to coordinate among researchers and users of research and education networks ...more+

Ning Wang
University of Surrey–The United Kingdom(https://www.surrey.ac.uk/)
The University of Surrey is a public research university located in Guildford, England, and was initially established in 1891, known at that time as Battersea College ...more+

Xiaohong Huang
Beijing University of Posts and Telecommunications–China
(https://english.bupt.edu.cn/)



About

Tsinghua University

On behalf of the Local Organizing Committee comprising members of CERNET, Tsinghua University and Shandong Quancheng Laboratory, we would like to extend our warmest welcome to all guests to the 54th Asia Pacific Advanced Network (APAN54) Meeting to be held in Jinan, Shandong Province, China on 22 — 26 August, 2022.

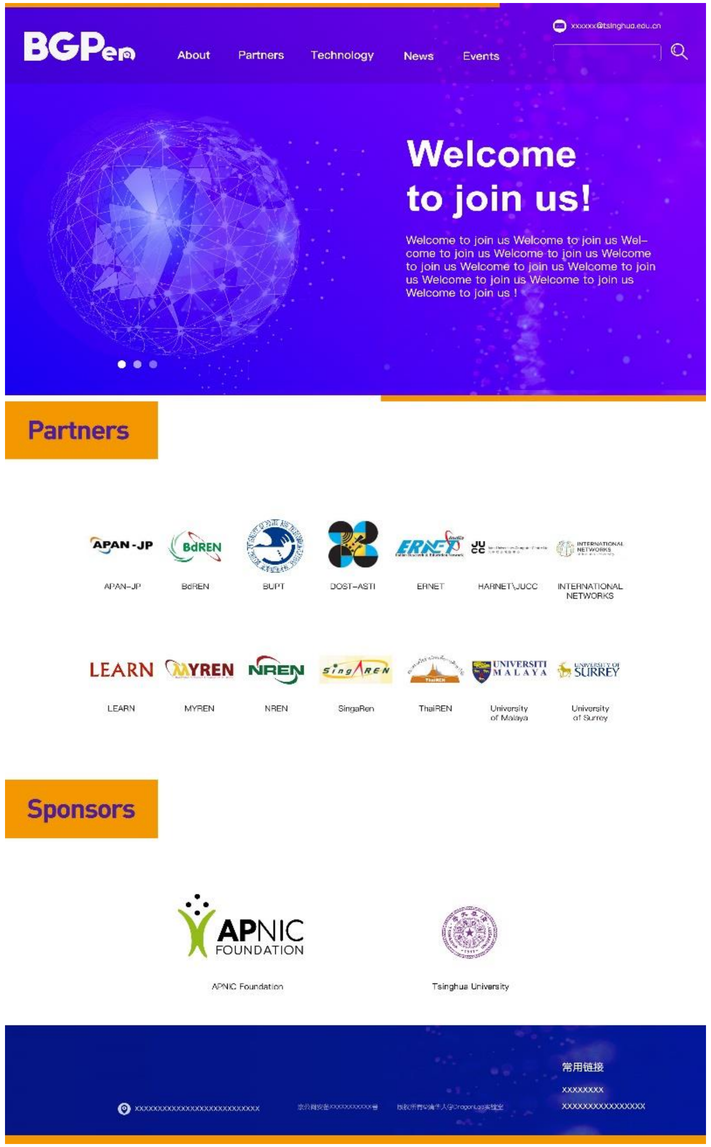
Due to the continued outbreak of COVID–19, the APAN Board and the Chinese LOC has decided to host the APAN hybrid meeting. Some participants from Chinese mainland attended the physical meeting and other guests attended the virtual meeting.

Since APAN was proposed and formed under a Memorandum of Understanding in 1997, it’s already 25 years. With all the continuous support and efforts of APAN primary members and partners, APAN has become a very important community in Asia Pacific Region for scholars, experts, teachers, engineers and students from or related to national academic network organizations to share ideas and experiences of Internet development, to face the challenges, and to explore collaboration opportunities. APAN meetings are held twice per year and provide an excellent platform for network staff, academics and scientists to work together to promote national, regional and international Internet development.

APAN54 will have a range of exciting keynote speakers and different varieties of programmes including training workshops, tutorials, presentations, demonstrations, conference sessions, and discussion panels. We sincerely invite all of you to register for this event and enjoy this exciting APAN54 meeting.

Partners need to provide:
Logo, Introduction: 100-300 word

Partner’s Information in Web Site (Scheme 2)



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Partners

APAN-JP
BdREN
BUPT
DOST-ASTI
ERNET
HARNET\JUCC
INTERNATIONAL NETWORKS
LEARN
MYREN
NREN
SingaRen
ThaiREN
University of Malaya
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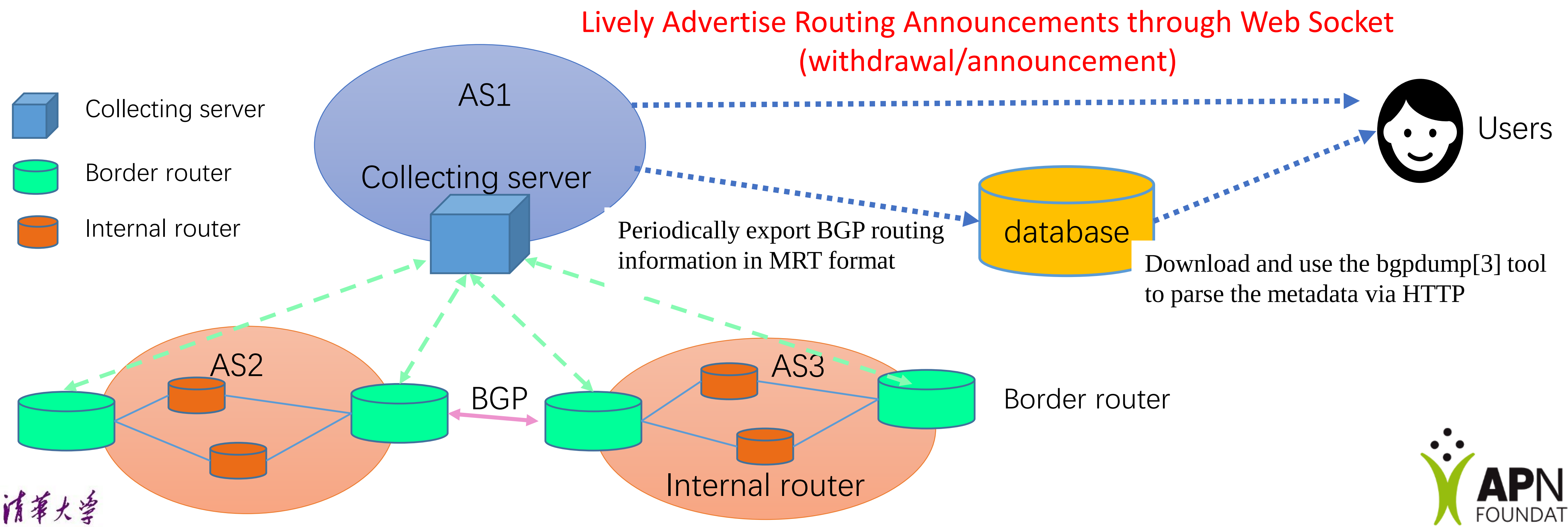
Alternative:
Logo, and a link to partner’s website

Architecture of Route Information Sharing Platform

- Collecting server： Use routing FRR[2] to simulate a real BGP router
- Border routers: Connect with the collecting server by BGP peering
- Feature: Lively Advertise Routing Announcements

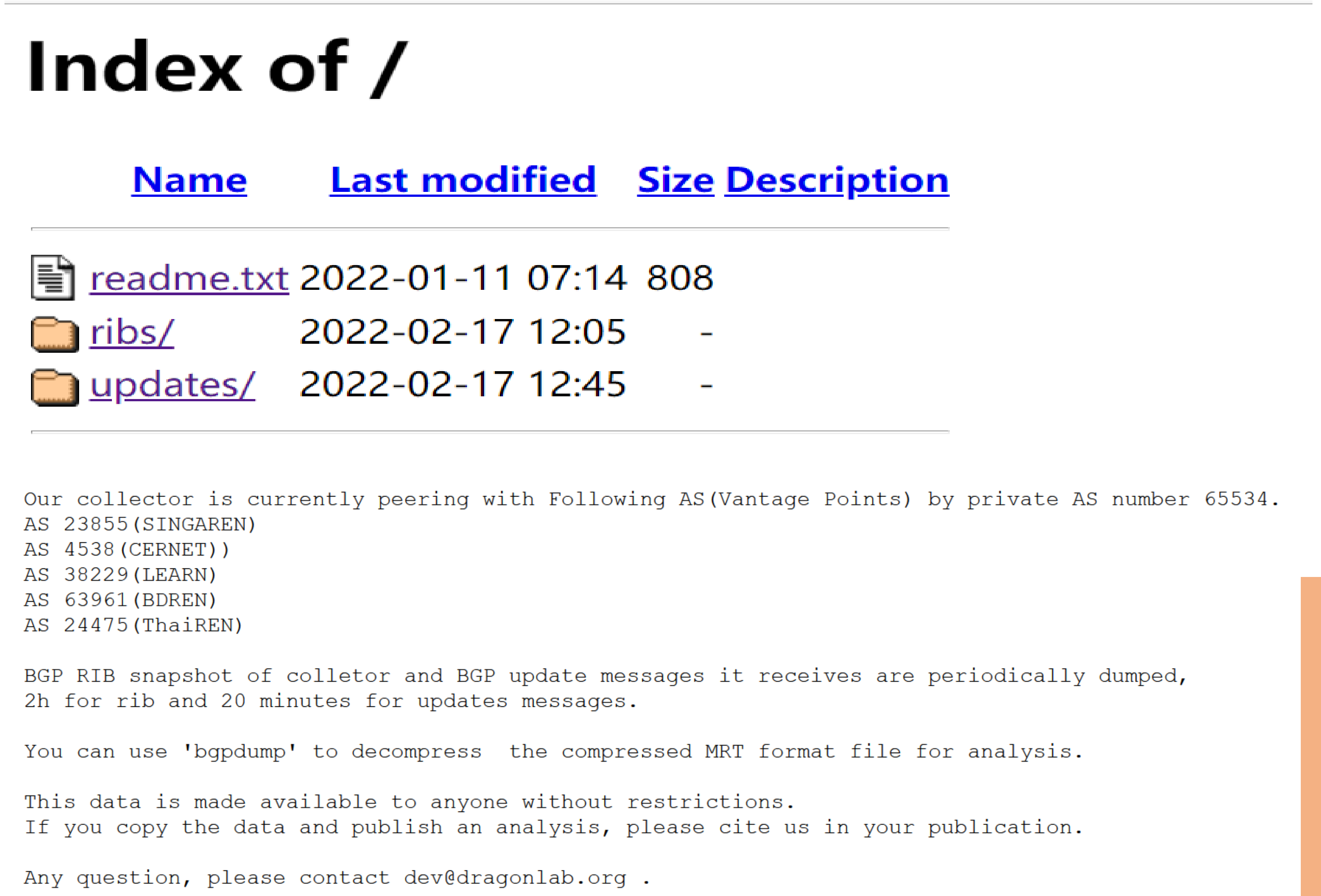


Lively Advertise Routing Announcements through Web Socket (withdrawal/announcement)

Periodically export BGP routing information in MRT format

Download and use the bgpdump[3] tool to parse the metadata via HTTP

BGP Routing Information Sharing Platform



Index of /

Name	Last modified	Size	Description
readme.txt	2022-01-11 07:14	808	
ribs/	2022-02-17 12:05	-	
updates/	2022-02-17 12:45	-	

```
Our collector is currently peering with Following AS(Vantage Points) by private AS number 65534.
AS 23855(SINGAREN)
AS 4538(CERNET))
AS 38229(LEARN)
AS 63961(BDREN)
AS 24475(ThaiREN)

BGP RIB snapshot of colletor and BGP update messages it receives are periodically dumped,
2h for rib and 20 minutes for updates messages.

You can use 'bgpdump' to decompress  the compressed MRT format file for analysis.

This data is made available to anyone without restrictions.
If you copy the data and publish an analysis, please cite us in your publication.

Any question, please contact dev@dragonlab.org .
```

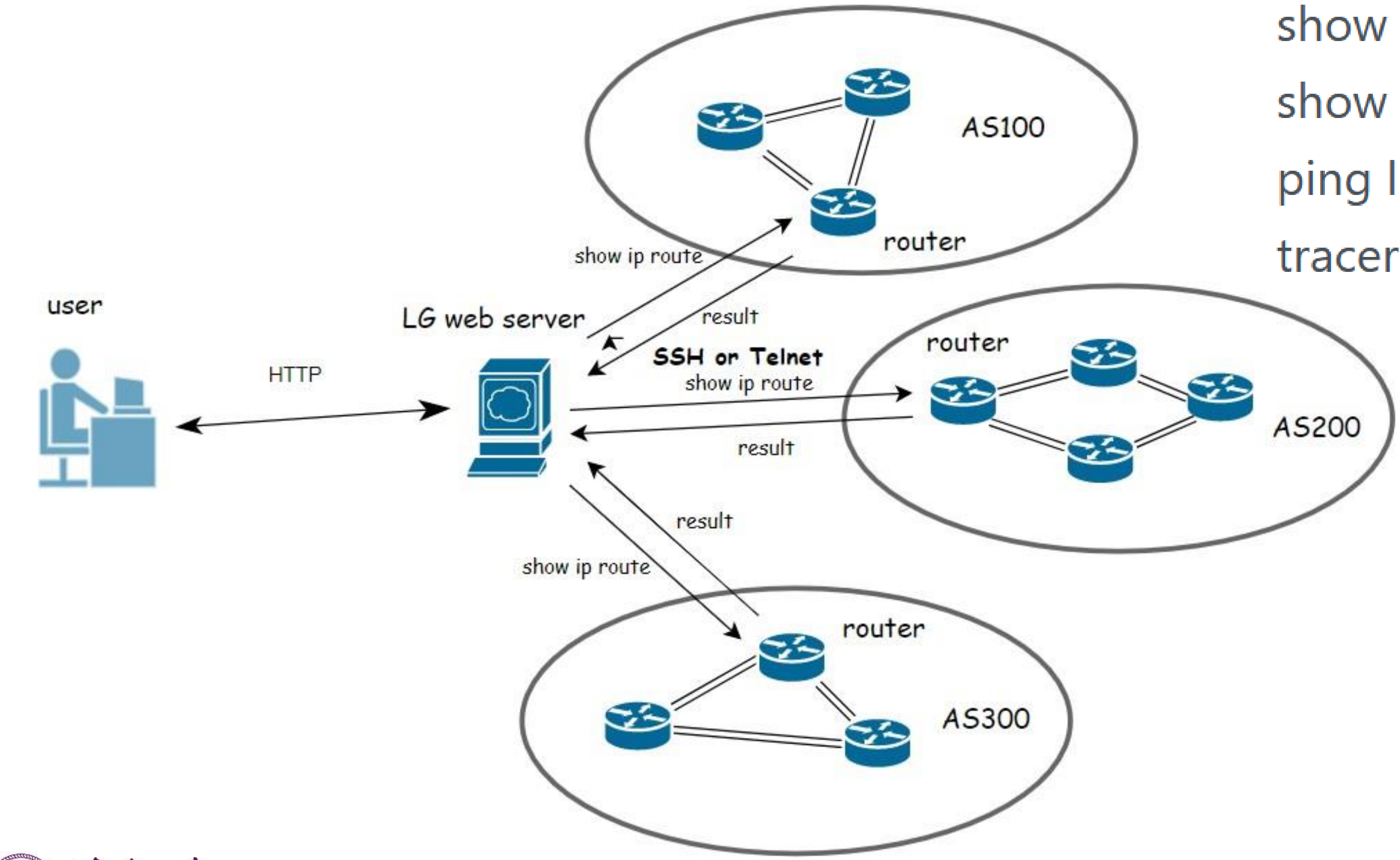
https://bgp.cgtf.net

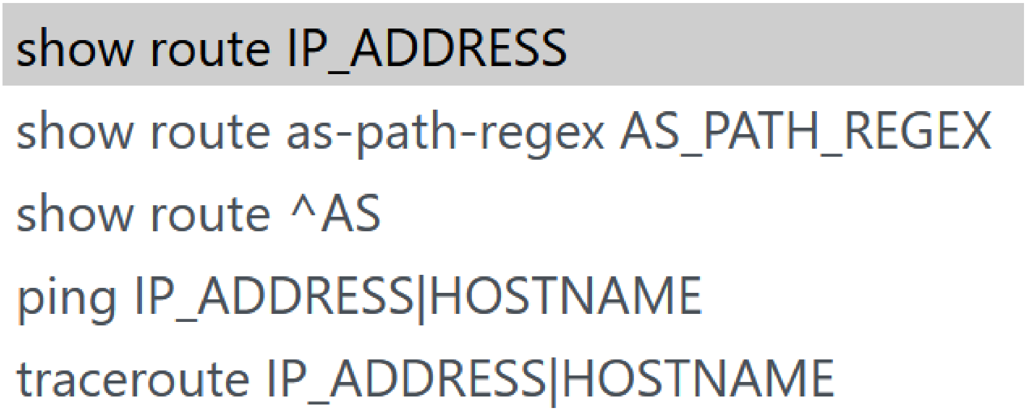
NRENs’ Contribution:

- CERNET
- SingAREN
- BdREN
- LEARN
- ThaiREN

- Executive Team will provide manual.
- Plan to be done in May-June.

Looking Glass Architecture



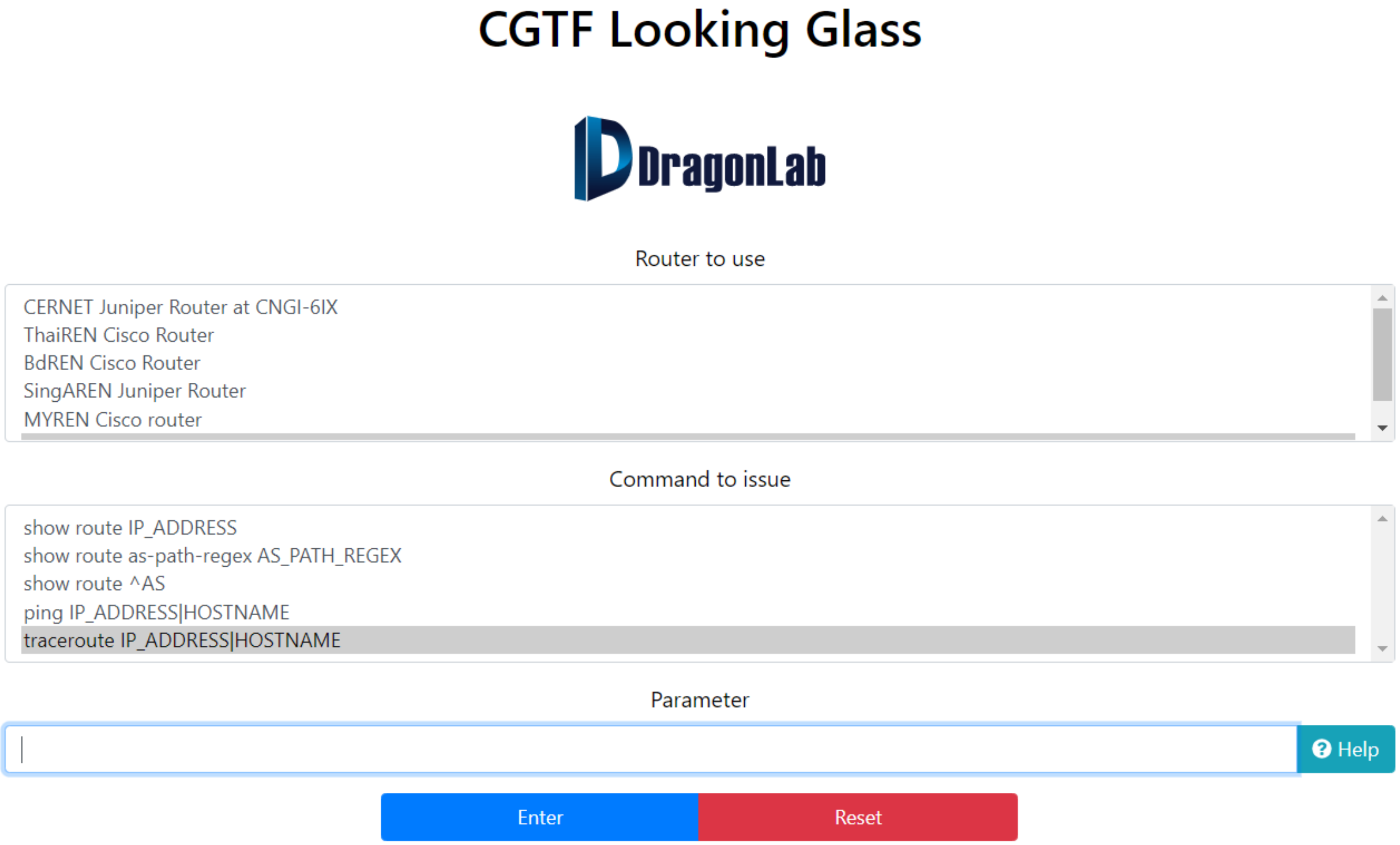


```
show route IP_ADDRESS
show route as-path-regex AS_PATH_REGEX
show route ^AS
ping IP_ADDRESS|HOSTNAME
traceroute IP_ADDRESS|HOSTNAME
```

- Executive Team will provide manual.
- Plan to be done in June.

Looking Glass Platform

- http://lg.cgtf.net
- Open Source:
  - https://github.com/gmazoyer/looking-glass
- 6 Education & Research network joined
- 5 commands
- Query speed limit for security
- More partners is welcomed



CGTF Looking Glass

Router to use

CERNET Juniper Router at CNGI-6IX
ThaiREN Cisco Router
BdREN Cisco Router
SingAREN Juniper Router
MYREN Cisco router

Command to issue

show route IP_ADDRESS
show route as-path-regex AS_PATH_REGEX
show route ^AS
ping IP_ADDRESS|HOSTNAME
traceroute IP_ADDRESS|HOSTNAME

Parameter

NRENs' contribution:

CERNET, ThaiREN, BdREN, SingAREN, MYREN,LEARN

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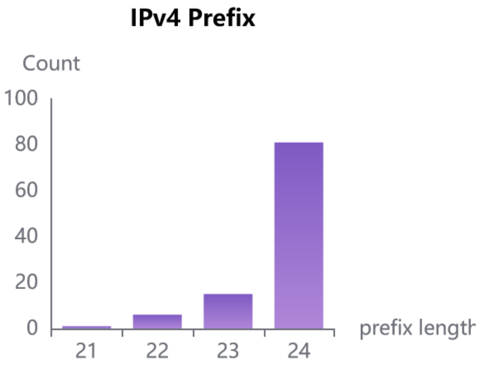
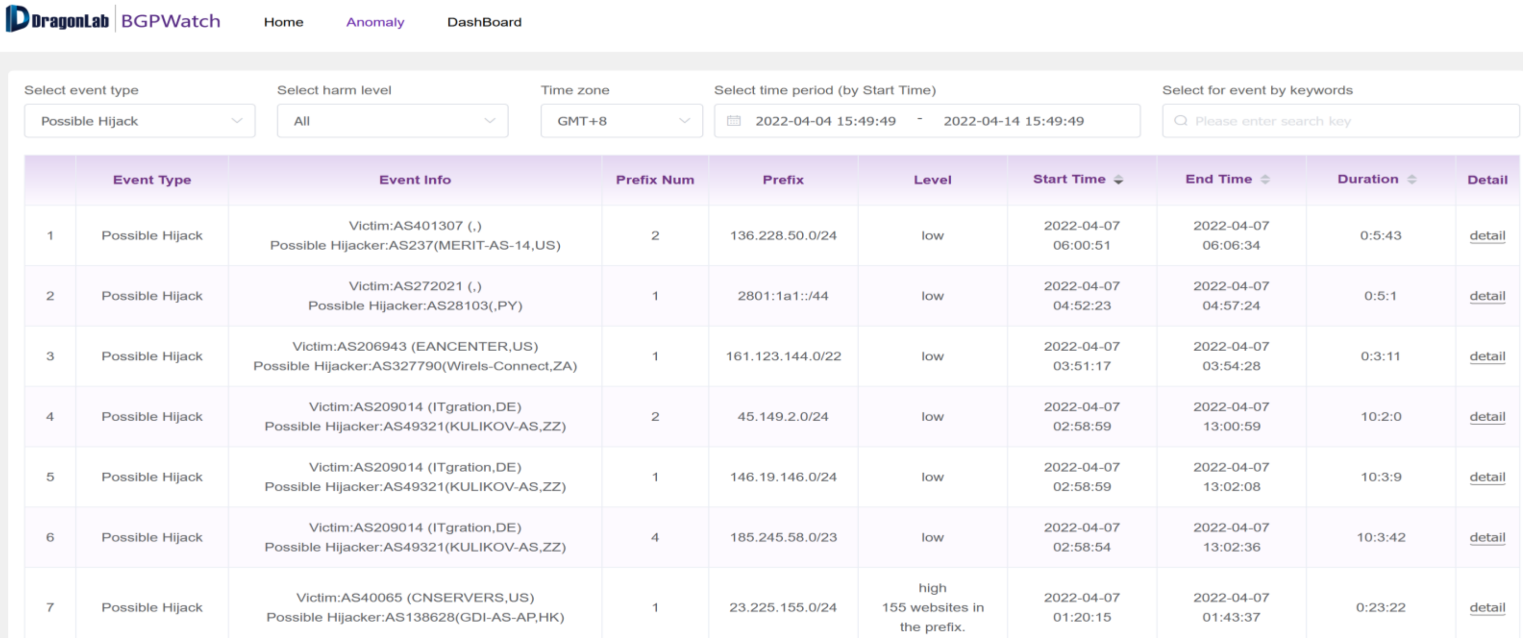
Analyzing and Diagnosing Platform

- Hijacking Detection
  - Prefix Hijacking Detection
  - Path Hijacking Detection
  - Send Alarm message to the victim
  - Partners can register for their AS , Prefix

https://bgpwatch.cgtf.net





Select event type: Possible Hijack

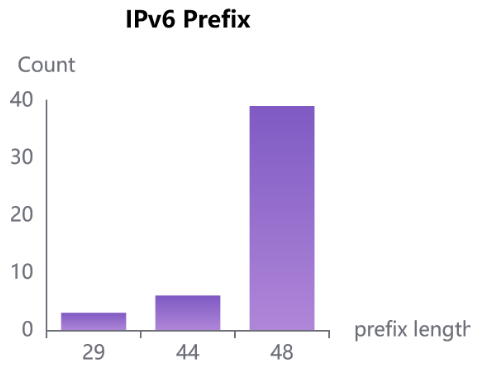
Select harm level: All

Time zone: GMT+8

Select time period (by Start Time): 2022-04-04 15:49:49 - 2022-04-14 15:49:49

Select for event by keywords: Please enter search key

	Event Type	Event Info	Prefix Num	Prefix	Level	Start Time	End Time	Duration	Detail
1	Possible Hijack	Victim:AS401307 (,) Possible Hijacker:AS237(MERIT-AS-14,US)	2	136.228.50.0/24	low	2022-04-07 06:00:51	2022-04-07 06:06:34	0:5:43	detail
2	Possible Hijack	Victim:AS272021 (,) Possible Hijacker:AS28103(,PY)	1	2801:1a1::/44	low	2022-04-07 04:52:23	2022-04-07 04:57:24	0:5:1	detail
3	Possible Hijack	Victim:AS206943 (EANCENTER,US) Possible Hijacker:AS327790(Wirels-Connect,ZA)	1	161.123.144.0/22	low	2022-04-07 03:51:17	2022-04-07 03:54:28	0:3:11	detail
4	Possible Hijack	Victim:AS209014 (ITgration,DE) Possible Hijacker:AS49321(KULIKOV-AS,ZZ)	2	45.149.2.0/24	low	2022-04-07 02:58:59	2022-04-07 13:00:59	10:2:0	detail
5	Possible Hijack	Victim:AS209014 (ITgration,DE) Possible Hijacker:AS49321(KULIKOV-AS,ZZ)	1	146.19.146.0/24	low	2022-04-07 02:58:59	2022-04-07 13:02:08	10:3:9	detail
6	Possible Hijack	Victim:AS209014 (ITgration,DE) Possible Hijacker:AS49321(KULIKOV-AS,ZZ)	4	185.245.58.0/23	low	2022-04-07 02:58:54	2022-04-07 13:02:36	10:3:42	detail
7	Possible Hijack	Victim:AS40065 (CNSERVERS,US) Possible Hijacker:AS138628(GDI-AS-AP,HK)	1	23.225.155.0/24	high 155 websites in the prefix.	2022-04-07 01:20:15	2022-04-07 01:43:37	0:23:22	detail



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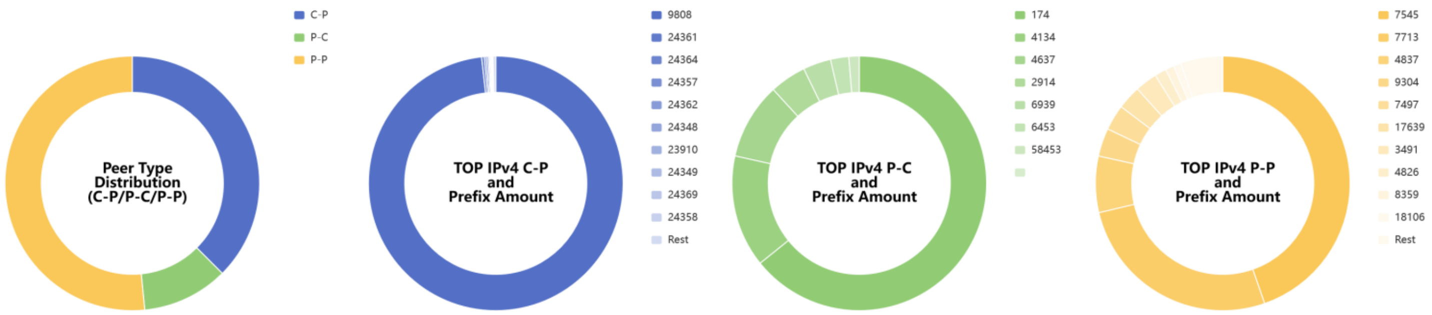
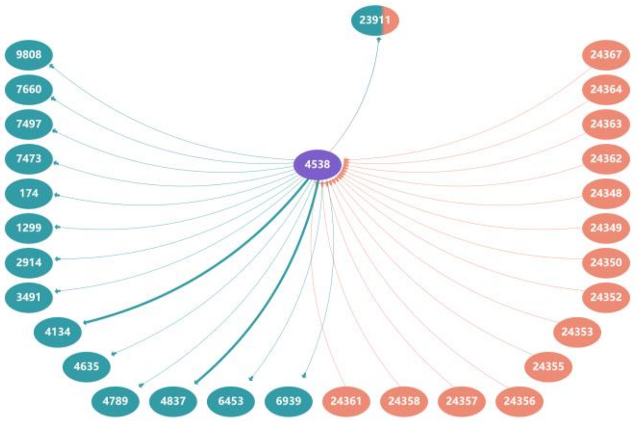
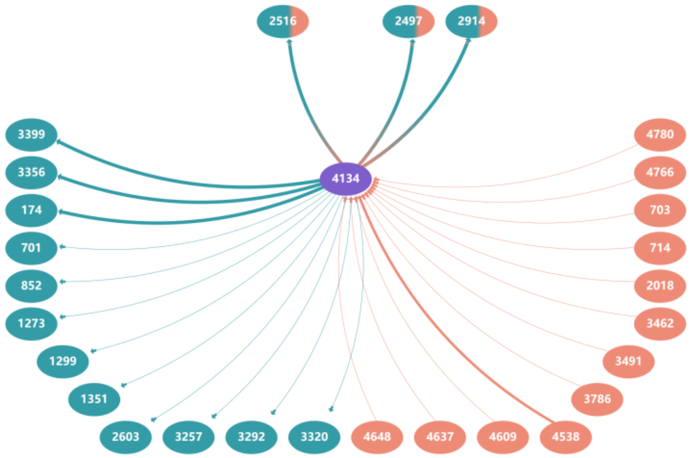
Analyzing and Diagnosing Platform

- Dashboard
  - Detailed information for AS
  - Peer relationship
  - Prefix import/export
  - Real time announcement received from peers
  - Path to a specific prefix
  - Path visualization
  - ……







Research Topic

- New routing information brought by the BGPer routing Information sharing platform
- Analyzing the robustness of the Asia Pacific Area routing
- Is peering relationships among NREN fully utilized?

Knowledge Sharing

- Any topic partners interested
    - Problems
    - RPKI
    - BGPSEC
    - MANRS

The outcome from the bilateral meetings

- APAN-JP: RPKI is becoming popular and the JP NIC is pushing like that way. Notification service will be very helpful. RADAR
- TransPAC: Asymmetrical routing. Traffic taking inefficient route
- ITB： Check and make sure routing going specific path, monitoring, debugging
- PREGINET: Find inefficient routing , BGP visualization. Open source: Zabbix, MRTG.
- KREONET: Real system in production level, time schedule, long term running, security concern with looking glass.
- REANNZ:MANRS compliance
- AARNET: GRIP (CAIDA’S BGP OBSERVATORY)

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Security Concerns

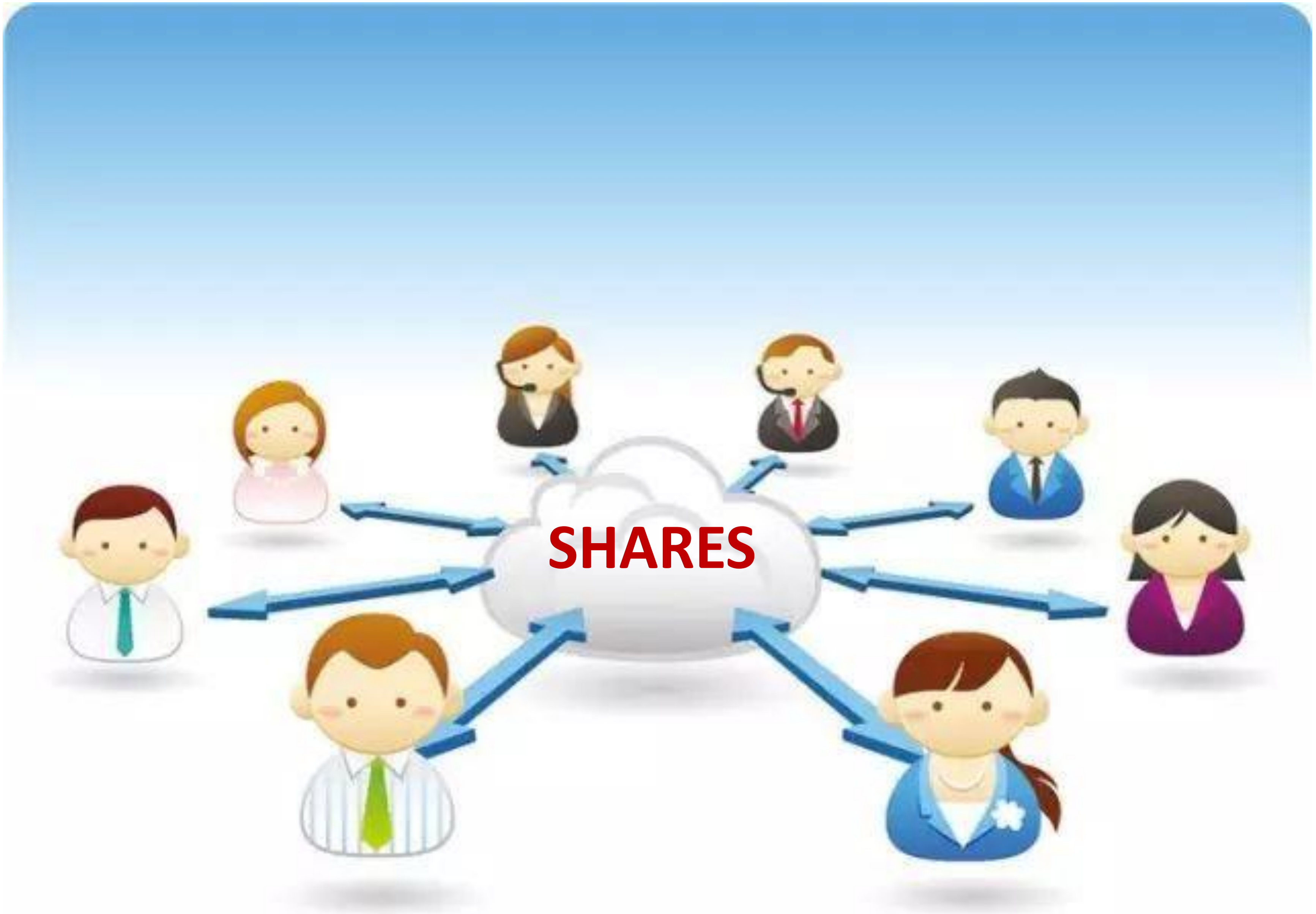
- Where the data is stored?
  - BGP sharing platform: Cloud server in Singapore
  - BGPWatch: Cloud server in Hongkong
  - Looking Glass: Cloud server in Hongkong
- Will peering harm my network?
  - We use routing FRR[2] to simulate a real BGP router and it won’t send routing anouncement.
- Will sharing routing information harm my network?
  - Routeviews and RIPE RIS are two most famous RIS sharing platform.
- Our security policy doesn’t permit ssh/telnet access from other network
  - Such as SingAREN, they use a VM to simulate a router, and peer with their real router. Then our looking glass access to the VM.

Todo List

	Detailed Technical Committee Work Plan	Tentative Timeline	Todo
Timeline	Discussion on Timeline	May	
Project Web Site	Requirements/Design	May	
	Partner’s information	May	Partners:send logo, introduction (100-300 words) to executive team:
	Setting up project website	May	Executive Team: set up the website.
BGP Routing Information Sharing	Requirements/Design(email, slack)	May-June	Executive Team :send manual to partners, discuss with each partner, and implement the peering. Partners: setup peering.
	Document info (How to implement, what partners need to do)	May-June	
	Implement the peering (meeting, email, slack)	May-June	

Comments/Suggestions

- ??


SHARES