Monitoring the impossible: CERN Video Conference use case (Vidyo)

By

Ruben Gaspar

White Area Webinar, 18th May 2020

Outline

- Quick intro to Vidyo conference system and CERN setup
- Solution principles & architecture
  - Online and aggregated dashboards
- Metrics architecture
- Conclusions

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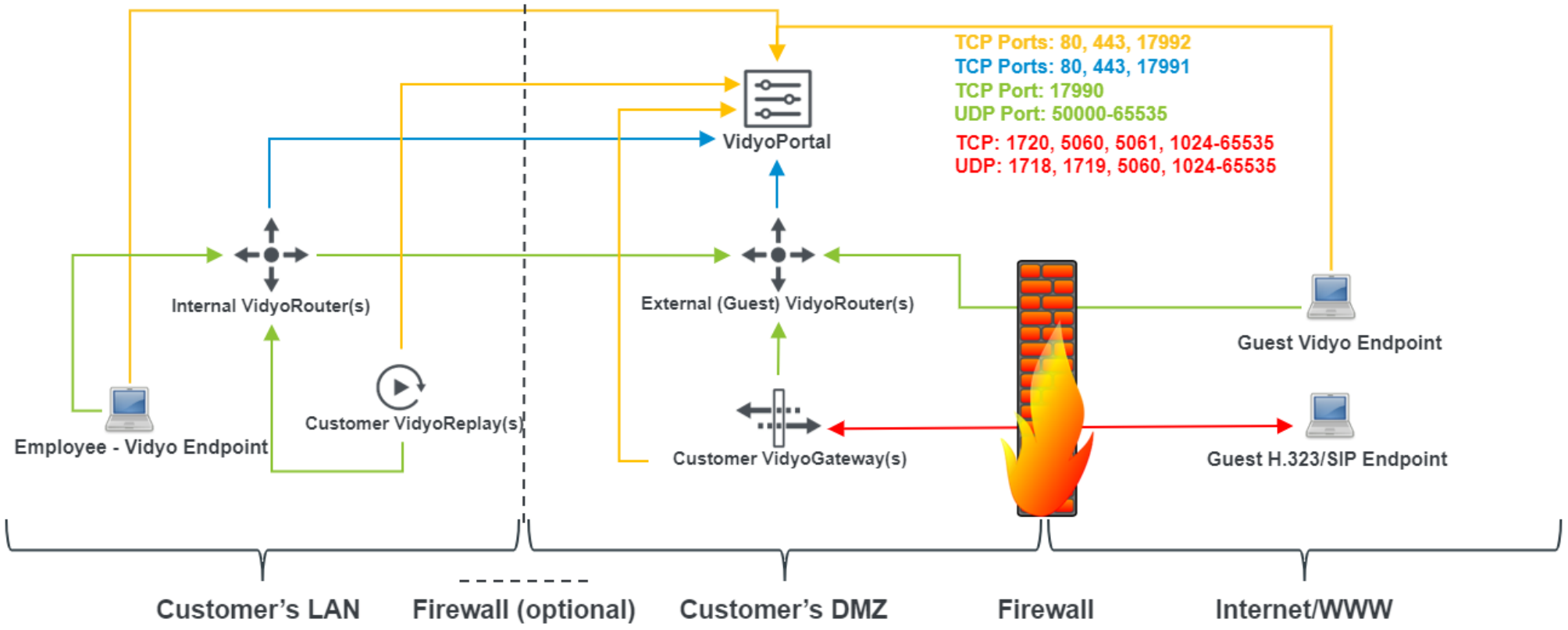
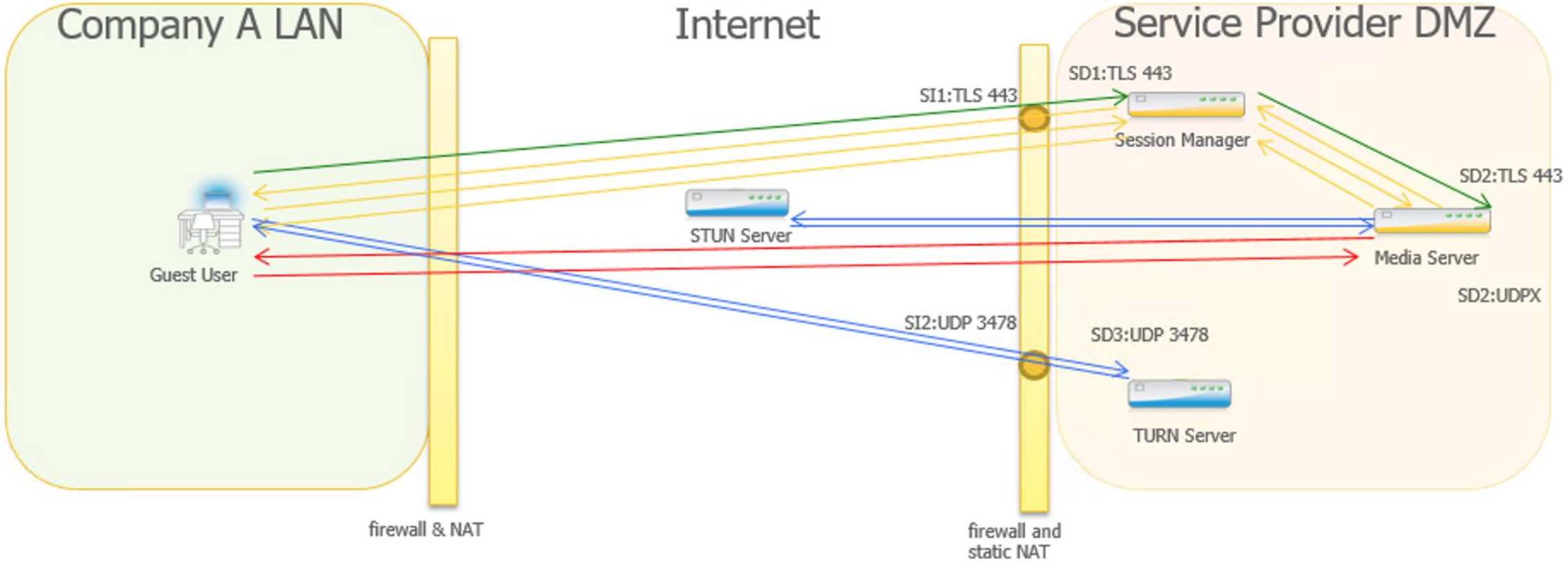
VidyoConnect Call Flow



*from https://support.vidyocloud.com/

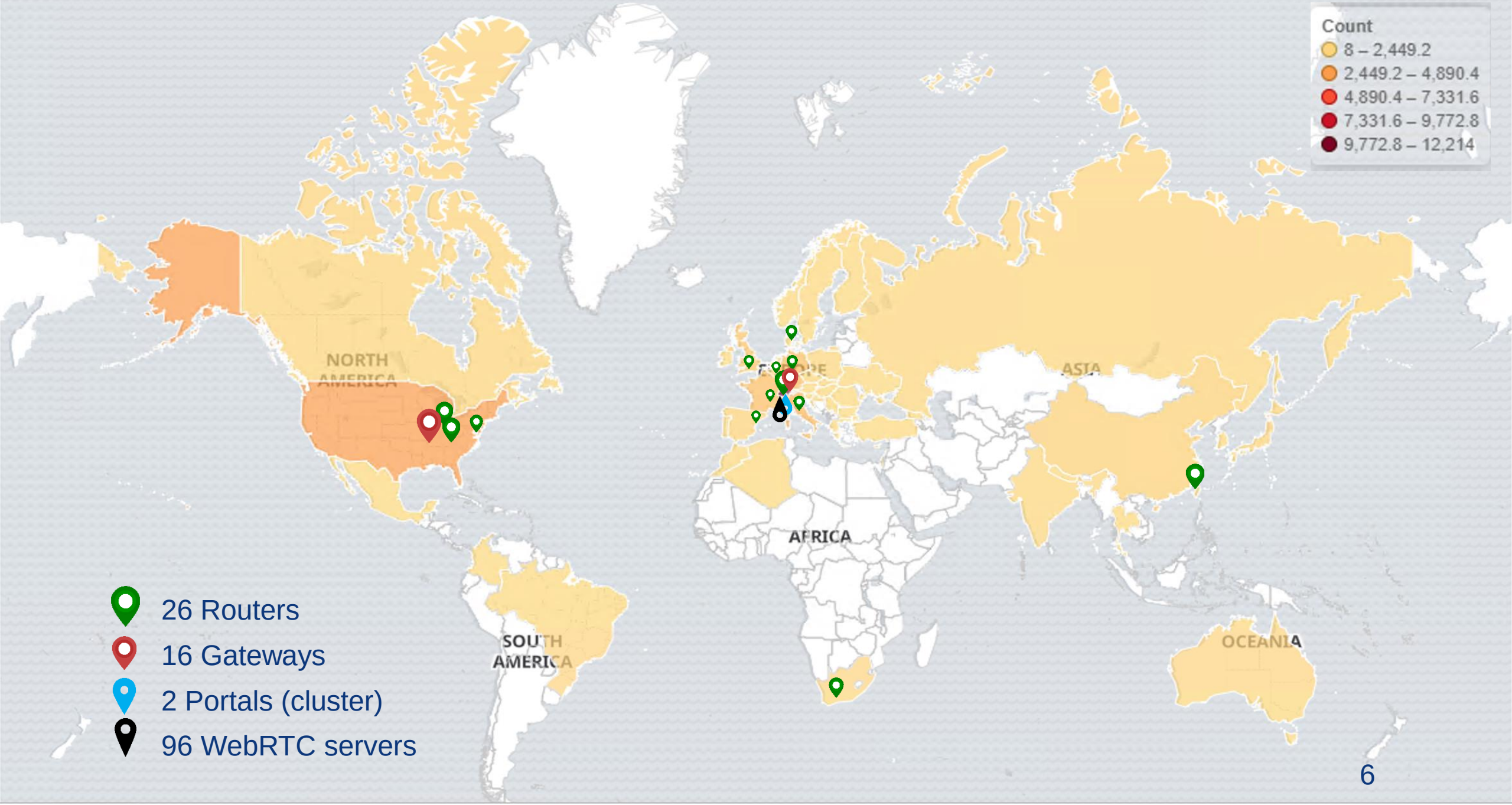
WebRTC call (permissive NAT)



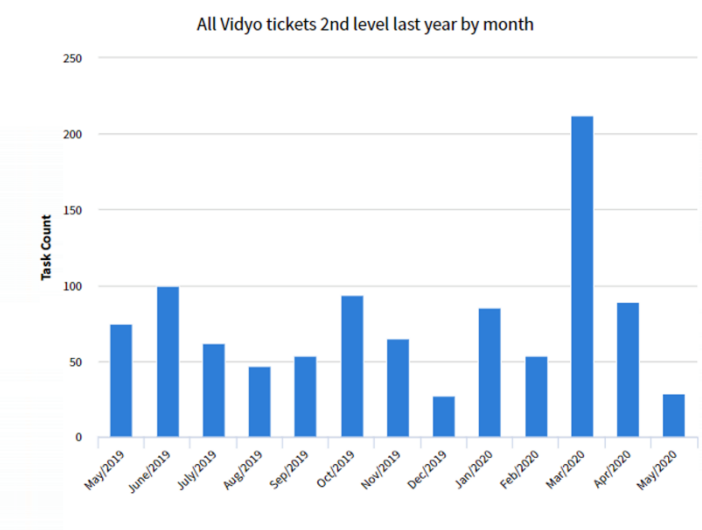
from https://support.vidyocloud.com/

Kibana: Geo dashboard

Geo distribution of conference calls participants in a week



Initial situation



- Servers running different versions of Ubuntu
  - Images provided by Vidyo
  - A new image usually removes previous customization
- Servers scattered around the world
  - Difficulties to manage them e.g. console session
- Vendor doesn't provide tools to monitor on premise infrastructure (portal)
  - system monitoring missing
- No clue about traffic, load on different components, meetings distributions
  - 2nd level support is quasi blind (using old drupal dashboard)
  - 3rd level support SQL queries against CDR to extract information
- Support cases usually very complex to solve e.g. audio issues, sharing, split brain meetings, gathering client logs, server logs,..

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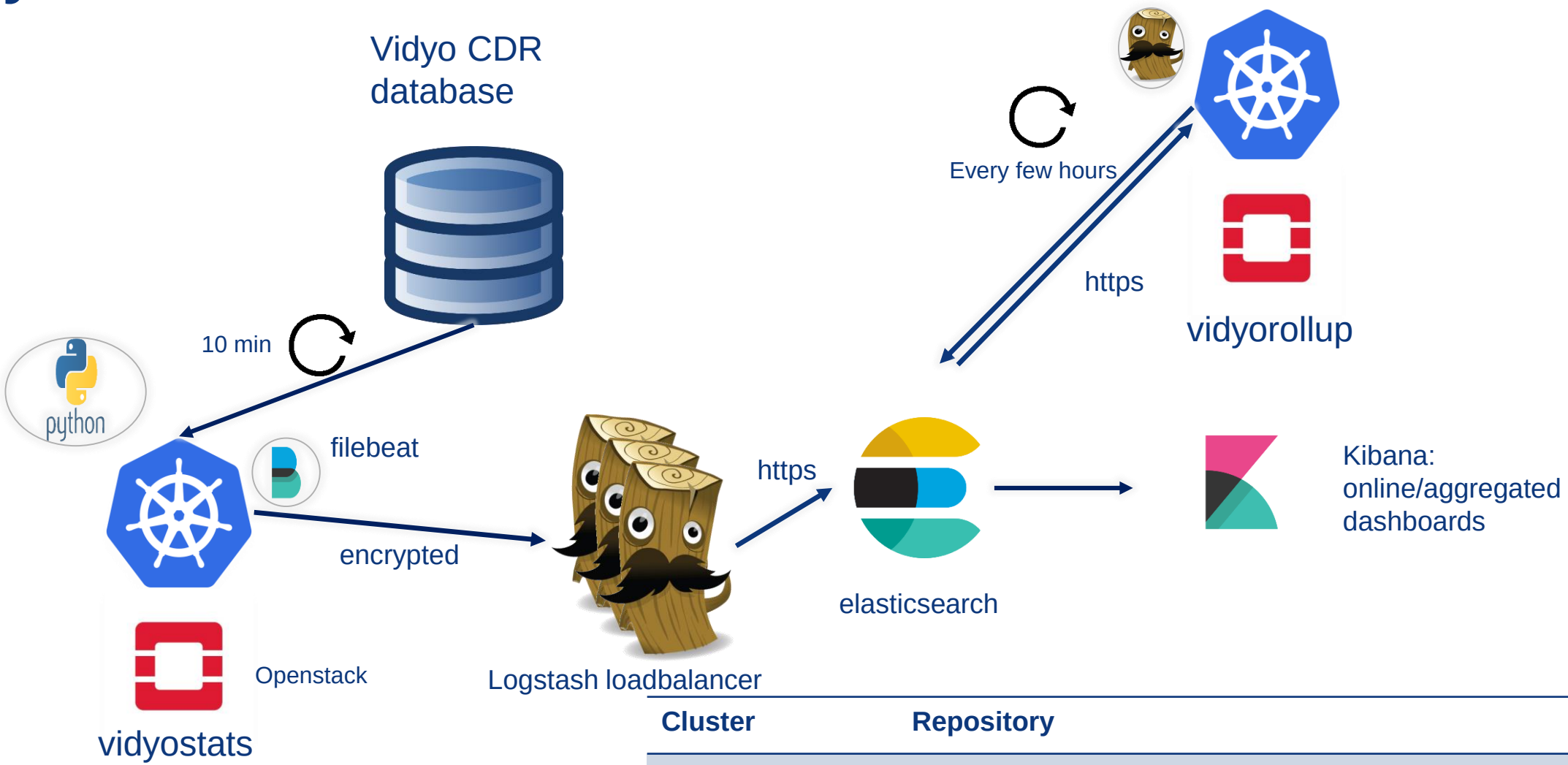
eXtreme monitoring principles for Vidyo

- Avoid nice to have for essential to have
- Reuse infrastructure e.g. logstash load balancer, ES cluster, etc.
- Code as little as possible → the less to debug the better
- Prepare the data so you can get meaningful visualizations → nosql document based records (pre-joined)
- Ease maintenance as much as possible
  - Use IT central services as much as possible
- Target your audience: service managers and 2nd level supporters
- It should be GDPR compliant

Vidyo stats collector architecture



Cluster	Repository
vidyorollup	https://github.com/CERNCDAIC/aggsvidyo
vidyostats	https://github.com/CERNCDAIC/resthttpck

VIDYO_AGGS:MaxSimulSessions

1,825
Max sim_sessions

VIDYO_AGGS:MaxPerConferenceUnique

406
ATLAS_Upgrade_Week_April2020@vidyoportal.cern.ch_153229392013643

VIDYO_AGGS:MaxPerConference

678
ATLAS_Upgrade_Week_April2020@vidyoportal.cern.ch_153229392013643

VIDYO_AGGS:MAX_meetings_per_...

2,500
Max Meetings Per Day at CERN

VIDYO_AGGS:Total_License_perTenant

9,053
ALL - Sum of installs

8,787
CERN - Sum of installs

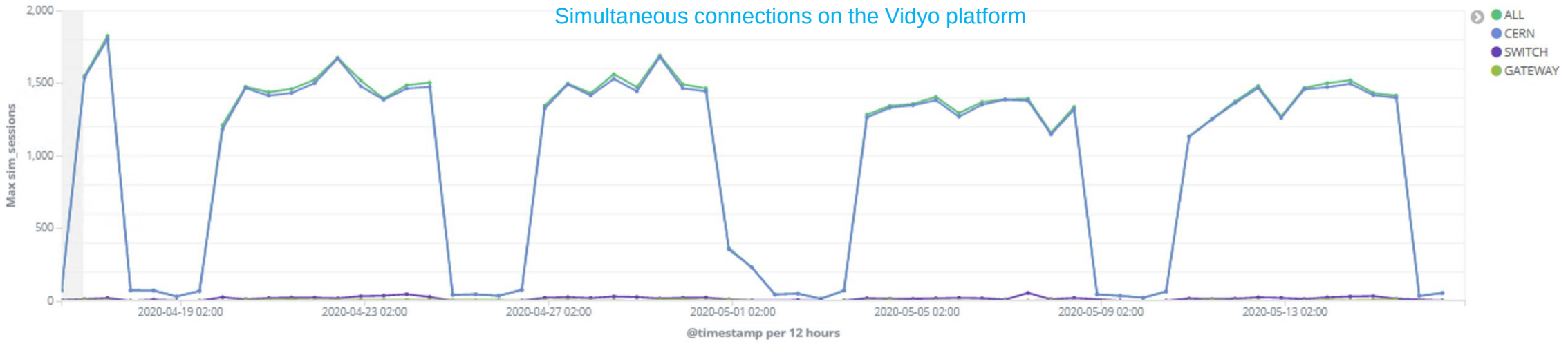
266
SWITCH - Sum of installs

VIDYO_AGGS:duration_Stats

25,561,846
Sum of summinutes

77.903
Average avgminutes

VIDYO_AGGS:Simultaneous_connections

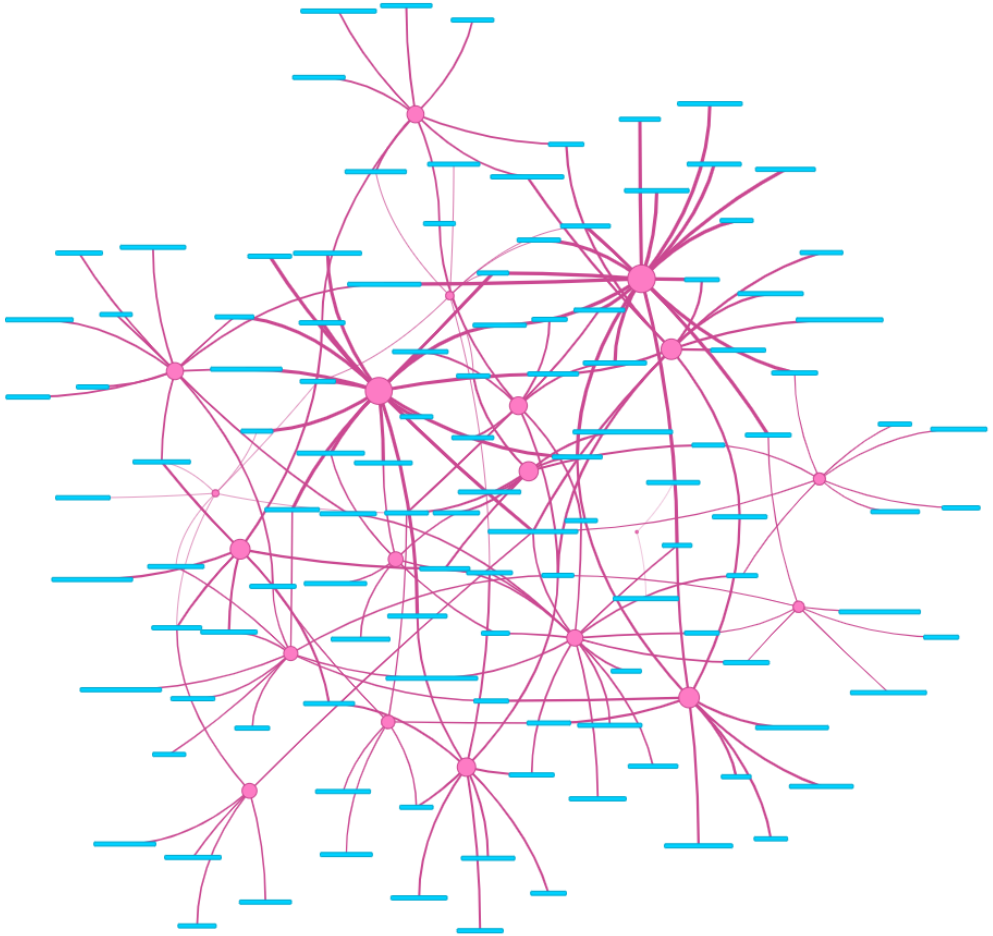


Kibana: Aggregate dashboard

Kibana: Aggregate dashboard

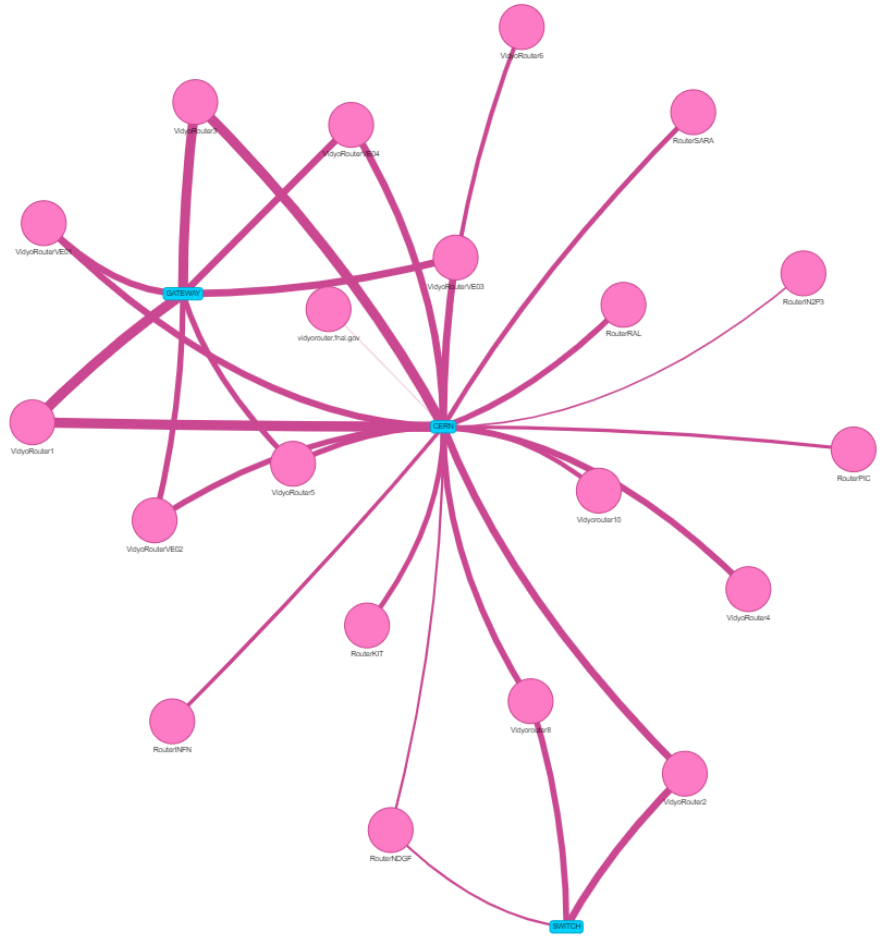
Kibana: Online stats

PROD_VIDYO:ConferenceName_Routers_inprogress



Core components relation with Vidyo meetings

PROD_VIDYO:GlobalView_RoutersGWs_Tenants_inprogress



Core components utilization

VIDYO_PROD:ApplicationClient_INPROGRESS

ApplicationName: Descending	Count
VidyoConnect Desktop	309
VidyoConnect WebRTC Linu	96
VidyoGateway	23
VidyoConnect Android	19
VidyoDesktop	19
VidyoConnect WebRTC Win	14
VidyoConnect WebRTC Mac	13
VidyoConnect iOS	9
VidyoConnect Desktop x86	1
VidyoMobile	1

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client apps in use

VIDYO_PROD:RoutersConnections_INPROGRESS

RouterName: Descending	Count
VidyoRouter2	57
VidyoRouter3	45
Vidyorouter8	44
VidyoRouterVE04	39
VidyoRouter1	36
VidyoRouterVE02	35
VidyoRouter5	34
VidyoRouterVE01	31
VidyoRouterVE03	29
RouterNDGF	24
	503

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routers in use

VIDYO_PROD:WEBRTCMediaServers_INPROGRESS

EndpointPublicIPAddress: Descending	Count
188.184.91.193	14
188.184.93.238	14
188.185.82.237	13
188.184.81.30	11
188.184.86.31	11
188.184.91.4	11
188.184.116.8	10
188.184.29.223	9
137.138.156.247	7
188.184.95.59	7

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WebRTC servers

VIDYO_PROD:ConferenceName_NumberofConnectedUsers_inprogress_table

ConferenceName: Descending	Count	RouterName: Descending	Count
FITCollaboration_Meeting@vidyoportal.cern.ch	24	VidyoRouter2	13
FITCollaboration_Meeting@vidyoportal.cern.ch	24	VidyoRouterVE04	11
ALICE_Quark_Matter_2019_rehearsals_B@vidyoportal.cern.ch	23	VidyoRouter3	12
ALICE_Quark_Matter_2019_rehearsals_B@vidyoportal.cern.ch	23	RouterNDGF	10
ALICE_Quark_Matter_2019_rehearsals_B@vidyoportal.cern.ch	23	RouterIN2P3	1

Vidyo conferences vs routers

VIDYO_PROD:Stats_Session_Duration

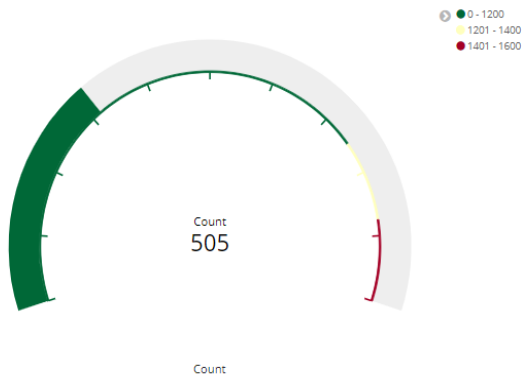
1,700
Count

1,486
Max sess_duration_min

41.579
Average sess_duration_min

finished calls duration stats

VIDYO_PROD:ActiveConnectionsGAUGE_INPROGRESS



active users

PROD_VIDYO:Gateway_Prefix_inprogress

GWName: Descending	GWPrefix: Descending	Count
VIDYOGW01	21	8
VIDYOGW01	27	4
CERNGW06	IVRDEFAULTC	4
CERNGW06	0	2
CERNGW06	13	1
CERN INDICO HD Cluster	24	3
INTERNET2 IVR GW	IVRDEFAULTC	1

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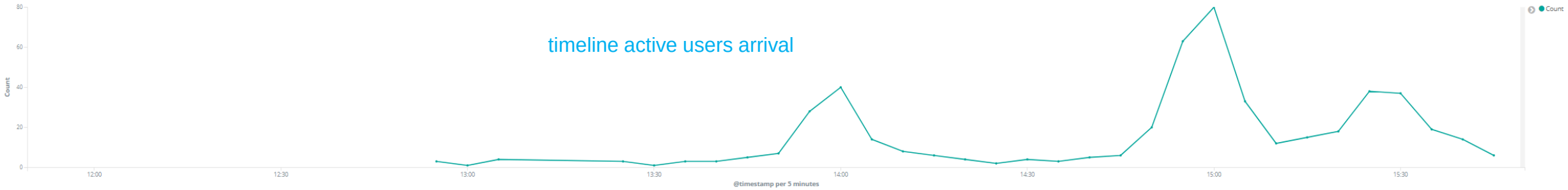
H.323/SIP calls

VIDYO_PROD:ActiveUsers_Time_INPROGRESS

timeline active users arrival



all_users_vidyocon_inprogress

1–50 of 505

Time	ConferenceName	RouterName	GWName	GWPrefix	ApplicationName	ApplicationVersion	Roomowner	CallerName	CallerID	RoomType	TenantName	geoip.country_code2
October 30th 2019, 15:46:24.000	IEAP_ATLAS_Group@vidyoportal.cern.ch	RouterNDGF	NA	-1	VidyoConnect Android	19.4.1.2804	andre	.... .rt-Z95Y6ZmBu0yzWO0jYjYV0g==	Guest	P	CERN	CZ
October 30th 2019, 15:46:15.000	McGill_University_Weekly_Group_Meeting@vidyoportal.cern.ch	VidyoRouter1	CERNGW06	IVRDEFAULTC	VidyoGateway	-	waahmed	1" .J6.1. I2	-	P	GATEWAY	-

Kibana: Online stats

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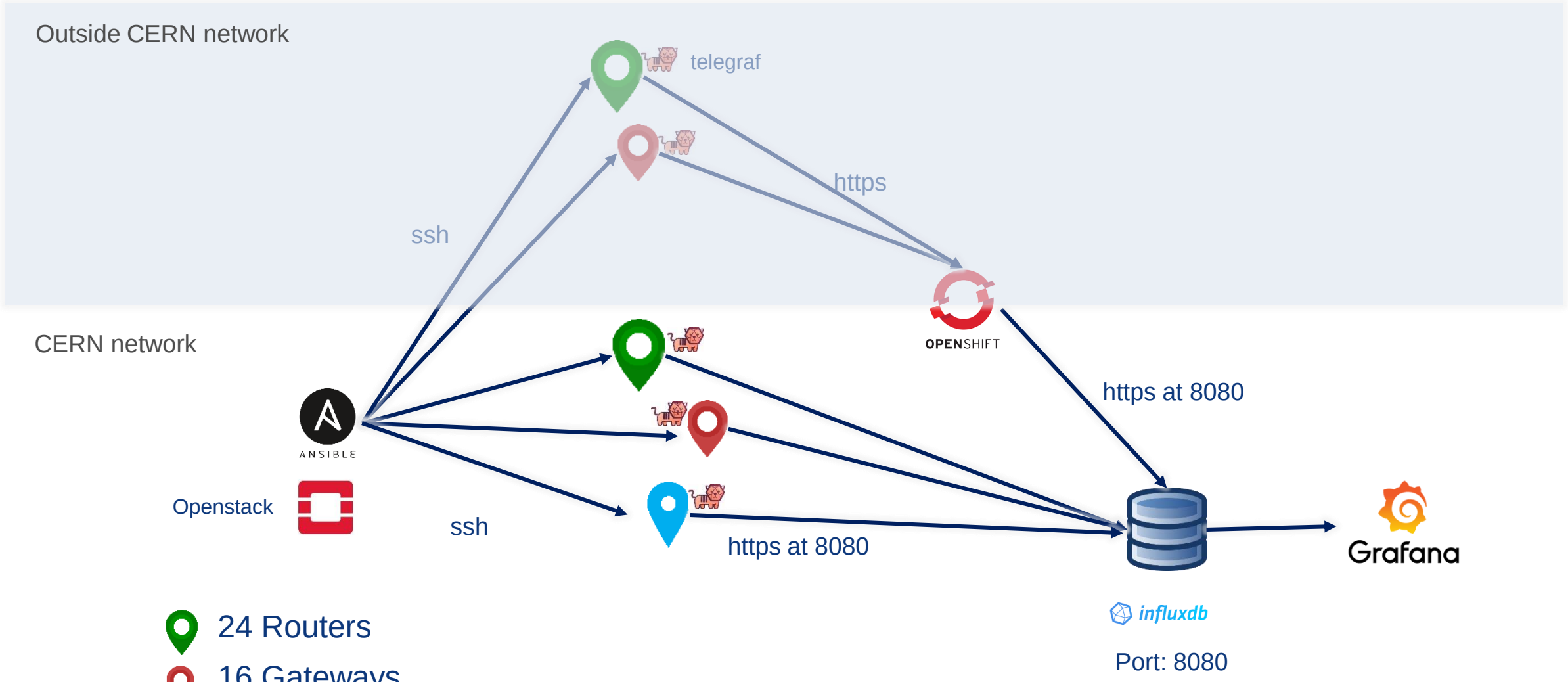
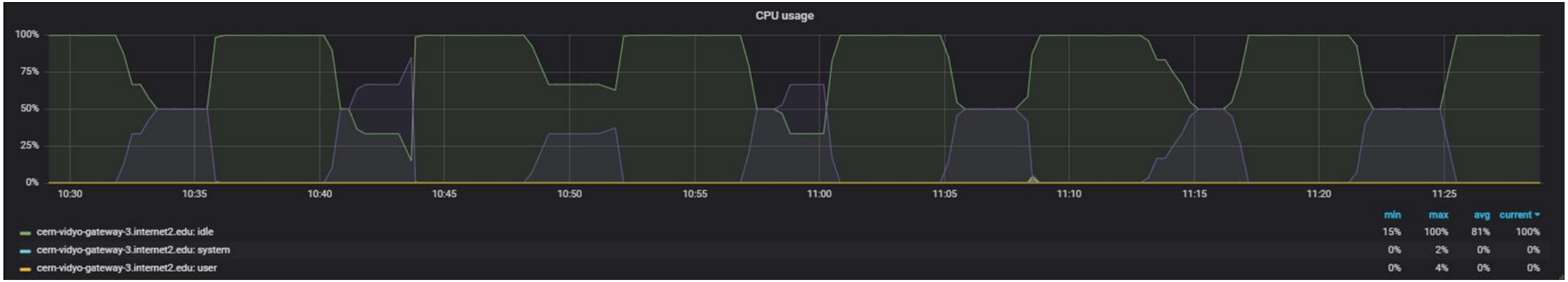
Metrics monitoring

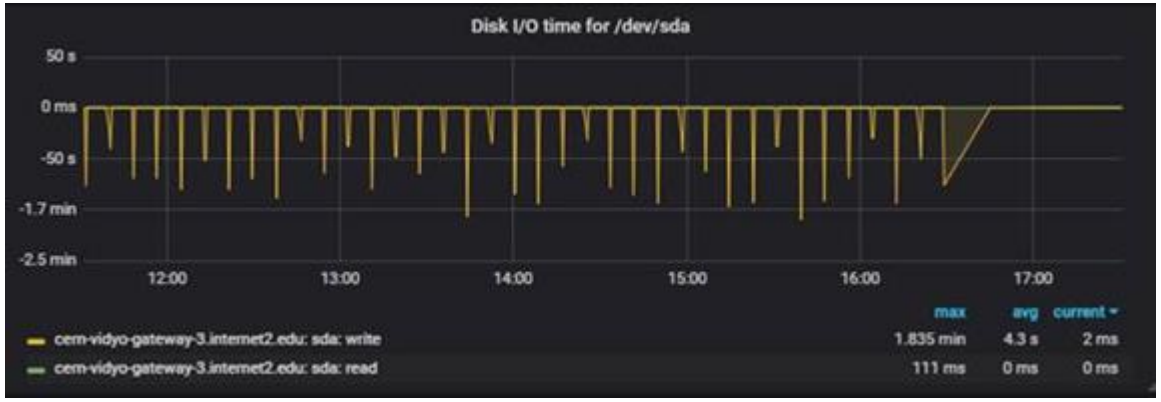
- Based on telegraf/influxdb/grafana
- Ansible roles for deployment
- Alerts via email & mattermost channel
- Openshift bridge for outside CERN servers
- Monitor important processes from Vidyo e.g. gwcc

Metrics collector architecture



Internet2 gateway issue - OTG0050828





- US deployed gateway running on VMWare
  - No ssh access to the underlying hypervisor
  - Pretty complicated to debug
- Thanks to metrics monitoring, solved by sending a disk instead of a full server

Other contexts

- E-mail: Exchange or Kopano
- Windows Terminal servers
- IoT

Let’s do a quick demo!

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- A data driven approach used in both cases
  - Almost agnostic of the domain/type of the devices to be monitored
- Very flexible design that allows to enrich the apps with new functionality/needs
- Pushing maintenance of the infrastructure to IT central services as much as possible
- Parts of the architecture being reused by other services e.g. Terminal service, Conversion service, Email service.