



Access Trends of In-network Cache for Scientific Data

Jack Ruize Han at U.C. Berkeley
Alex Sim, John Wu at LBNL
Inder Monga, Chin Guok at ESnet
Frank Würthwein, Diego Davila at U.C. San Diego
Justas Balcas, Harvey Newman at Caltech



Introduction

- **Data generation in scientific experiments and simulations**
 - Data volume is large, challenging for geographically distributed large collaborations
 - E.g., Large Hadron Collider (LHC) from High-Energy Physics (HEP) community
 - Data stored at a few locations, requiring significant networking resources
 - ATLAS Tier-1 site at Brookhaven National Laboratory
 - CMS Tier-1 site at Fermi National Accelerator Laboratory
 - Network traffic primarily carried by Energy Sciences Network (ESnet)
- **Observation**
 - Significant portion of the popular dataset is transferred multiple times
 - Storage cache allows data sharing between users in same region
 - Reduce the redundant data transfers over the wide-area network
 - Save network traffic volume
 - Lower data access latency
 - Improve overall application performance
 - Use case: Southern California Petabyte Scale Cache (SoCal Repo)

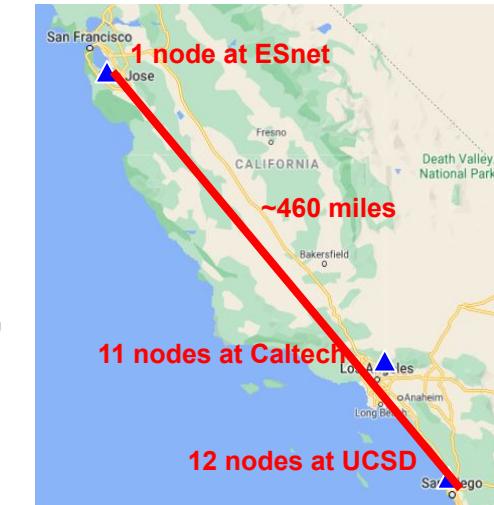


Introduction (2)

- **Goals in this study: Explore measurements from Southern California Petabyte Scale Cache (SoCal Repo) to understand**
 - Trends of network traffic volume
 - Effectiveness of the SoCal Repo in reducing network traffic
 - Predictability of traffic patterns for uses beyond HEP community
- **Measurement data**
 - Logs from SoCal Repo nodes from July 2021 - Jan 2022
 - Analysis on Cori at NERSC
- **Key observations**
 - On cache utilization and network utilization
 - Reduce the traffic by 2.35X during normal uses
 - On predictability of resource loads and utilization
 - Achieve 88.4% accuracy despite the dramatic changes in usage patterns
- **Postulate: a general in-network cache could supplement the existing regional data repository and benefit wider user community**

Southern California Petabyte Scale Cache (SoCal Repo)

- High-Luminosity Large Hadron Collider
 - HL-LHC aims to increase performance after 2025
- SoCal Repo consists of 24 federated storage caches for US CMS
 - 12 nodes at UCSD: each with 24 TB, 10 Gbps network connection
 - 11 nodes at Caltech: each with storage sizes ranging from 96TB to 388TB, 40 Gbps network connections
 - 1 node at ESnet: 44 TB storage, 40 Gbps network connection
 - Approximately 2.5PB of storage capacity
 - <200km between UCSD and Caltech nodes, round trip time (RTT) < 3 ms
 - ~700km between ESnet and UCSD nodes, RTT ~10 ms
- Working with US CMS data analysis using MINIAOD/NANOAOD
 - One Caltech node is for NANOAOD, and the rest are for MINIAOD
 - Analysis Object Data (AOD):
 - 384 PB of RAW
 - 240 PB of AOD
 - 30 PB of MINIAOD
 - 2.4 PB of NANOAOD
 - Mostly on Tape => accessed a few times per year
 - Mostly on disk => heavily re-used by many researchers



Sunnyvale–San Diego
is the relevant distance scale

Data Access Trend

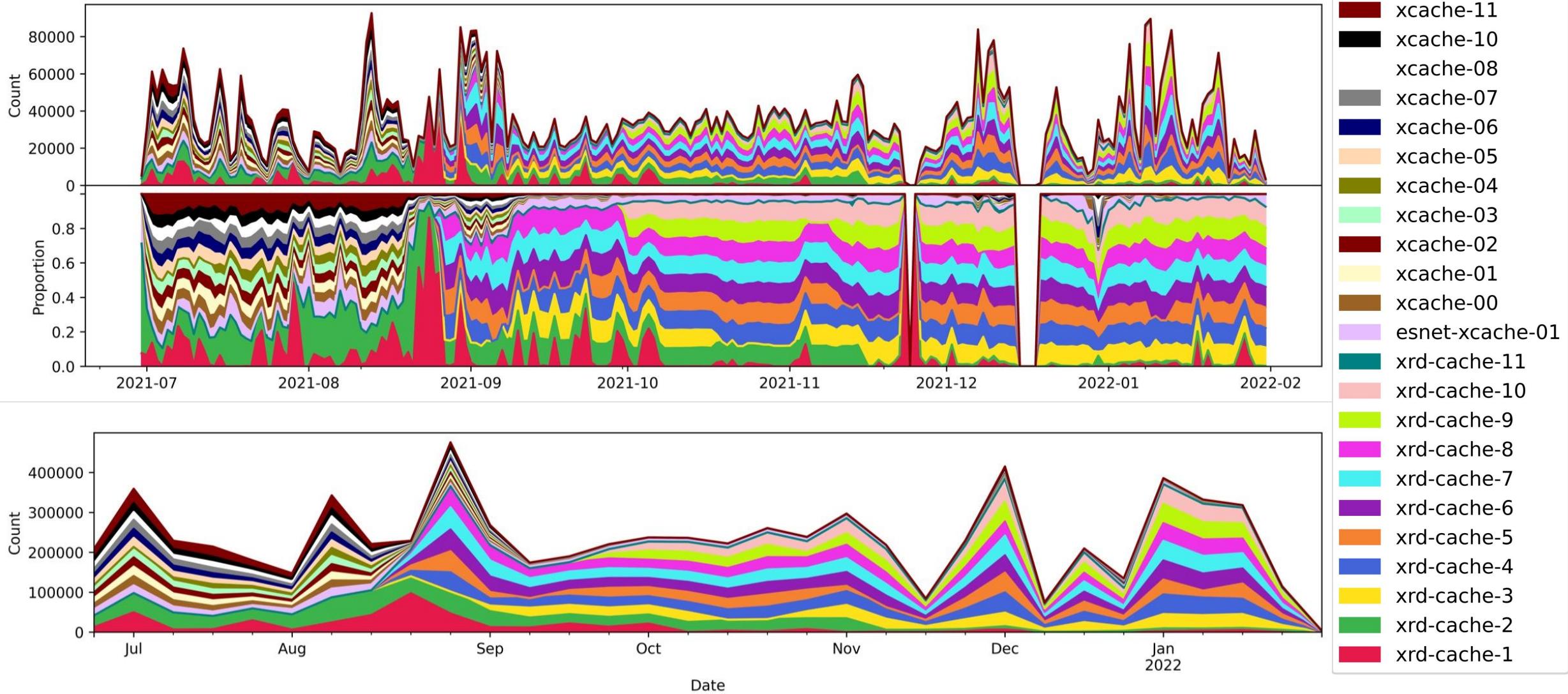
Summary data accesses July 2021- Jan 2022

	Number of accesses	Transferred data size (TB)	Shared data size (TB)	Net Traffic Reduction
July 2021	1,182,717	385.78	519.25	2.35
Aug 2021	1,078,340	206.94	313.46	2.51
Sept 2021	1,089,292	206.96	257.18	2.24
Oct 2021	1,058,071	412.18	141.91	1.34
Nov 2021	878,703	649.30	82.67	1.13
Dec 2021	983,723	1,257.89	130.03	1.10
Jan 2022	1,207,332	2,238.59	148.26	1.07
Total	7,478,178	5,357.66	1,592.78	1.30
Daily average	35,441.60	25.51	7.55	

- Data transfer size
 - First time data access size, i.e., cache misses
 - From remote sites to the local node cache, then to application
- Shared data access size
 - Repeated data accesses, i.e., cache hits, no need to transfer from remote sites
 - From the local node cache to the application
- Net (wide-area) Traffic Reduction
 - Total Access size / Transferred Data Size

Number of Accesses

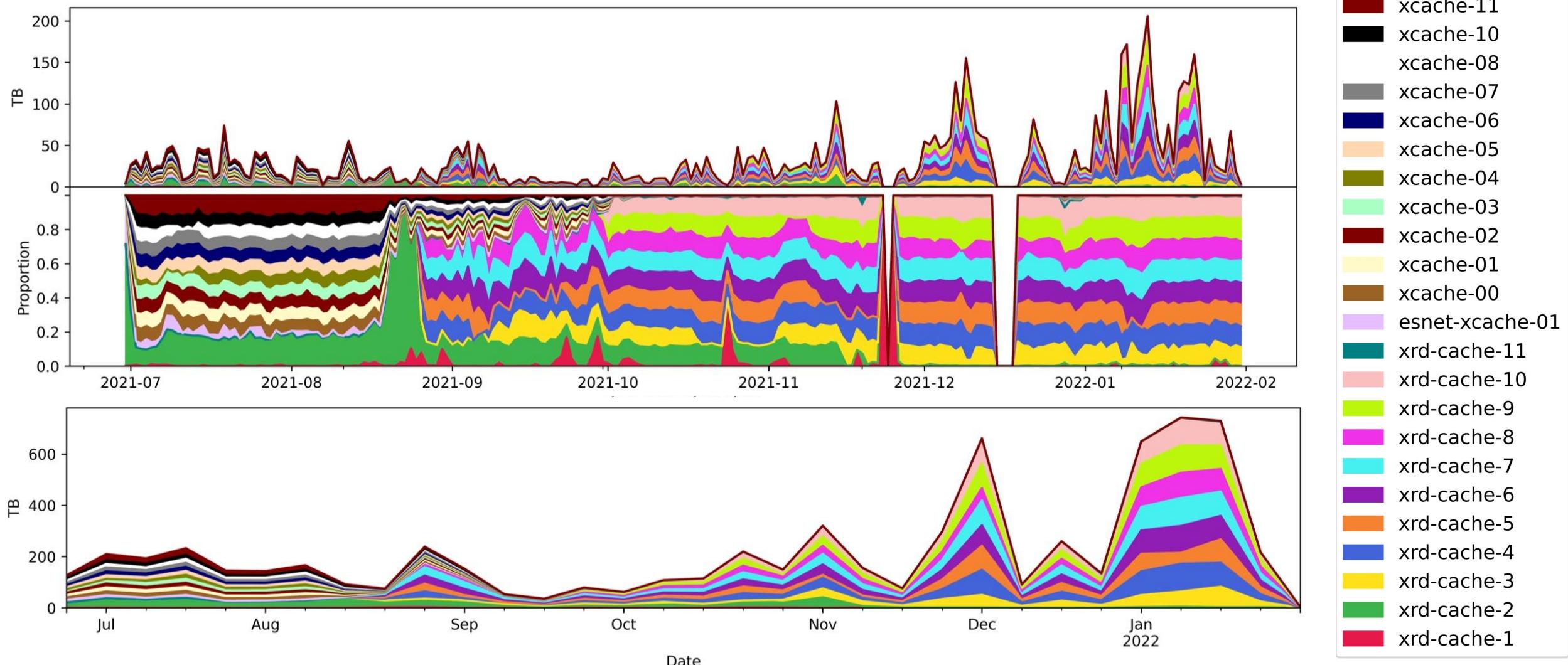
Fluctuates Around 31000 Per Day





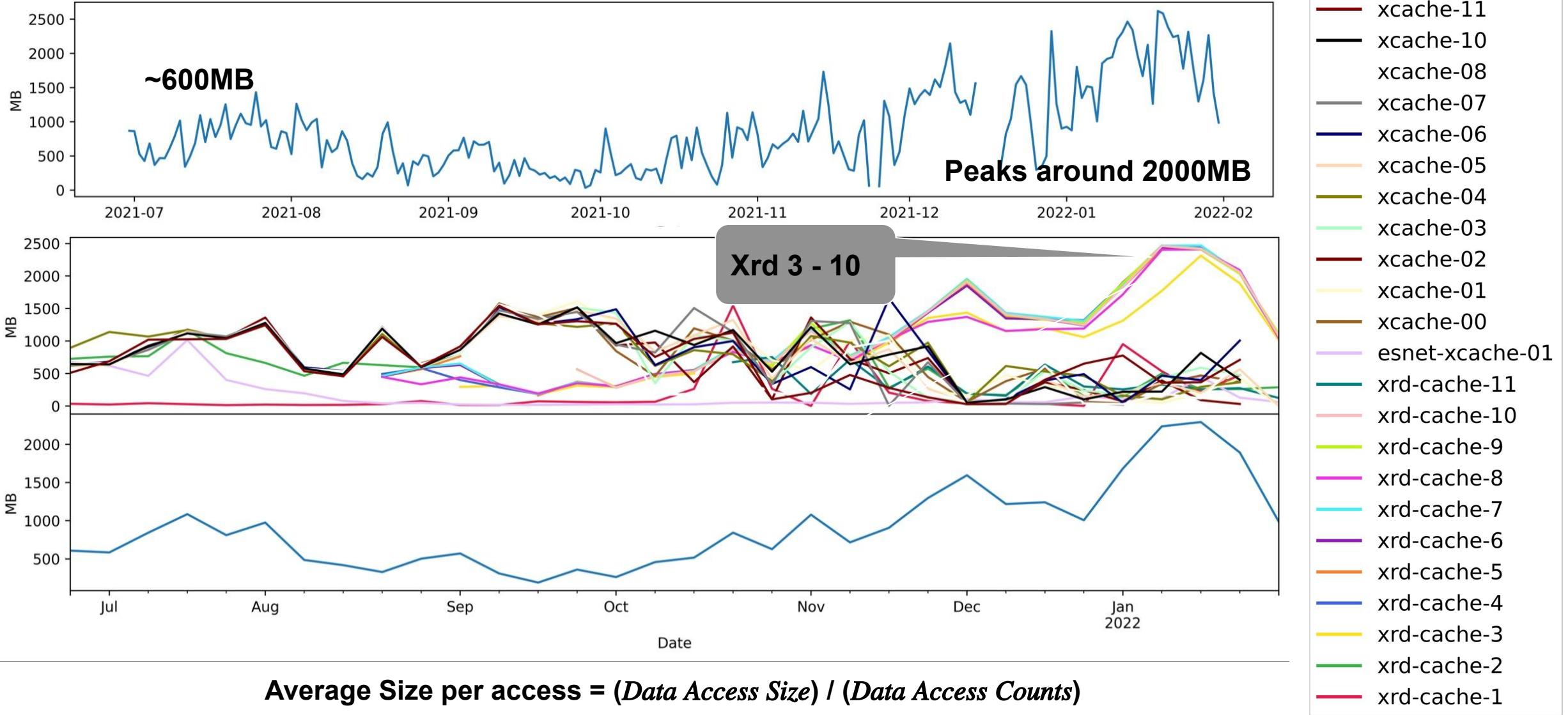
Volume of Data Accesses Hovers Around 21TB/day

Large Amounts of New Files in December and January



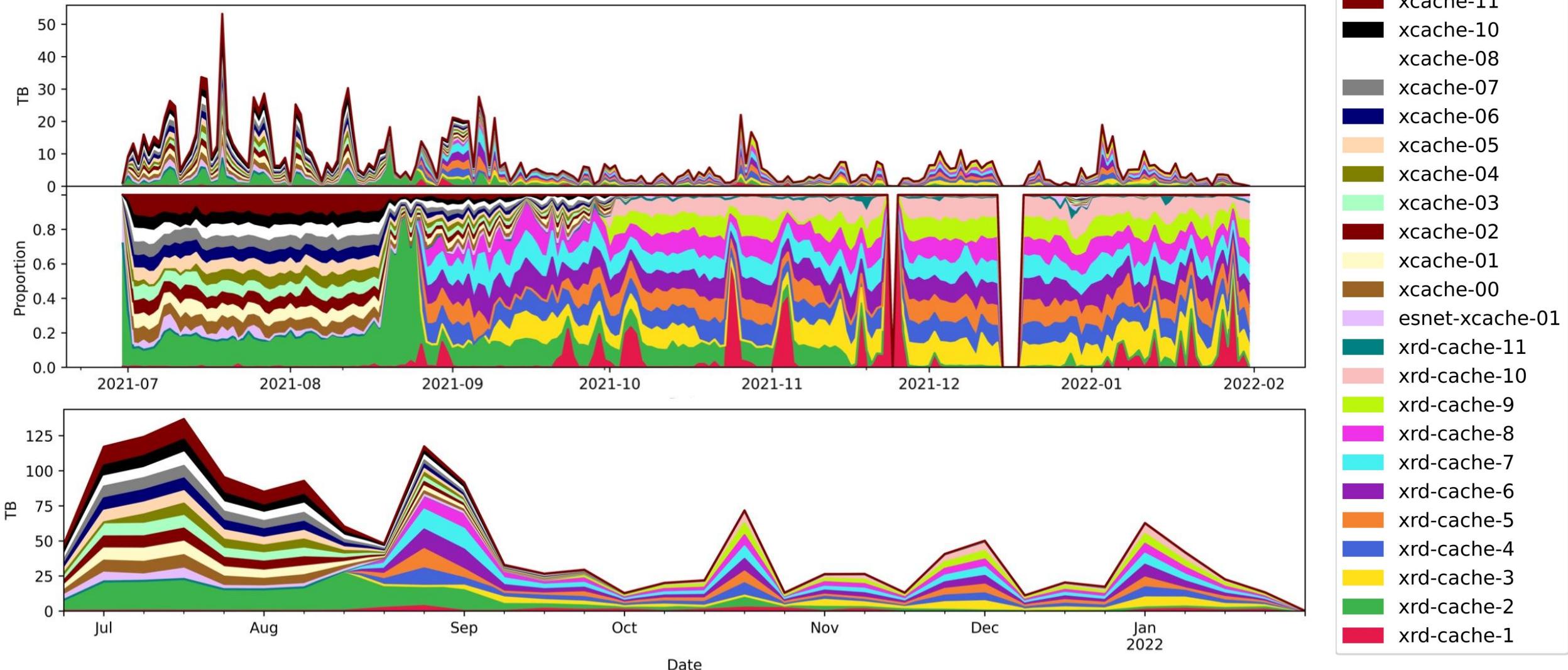


Average Data Size per Access

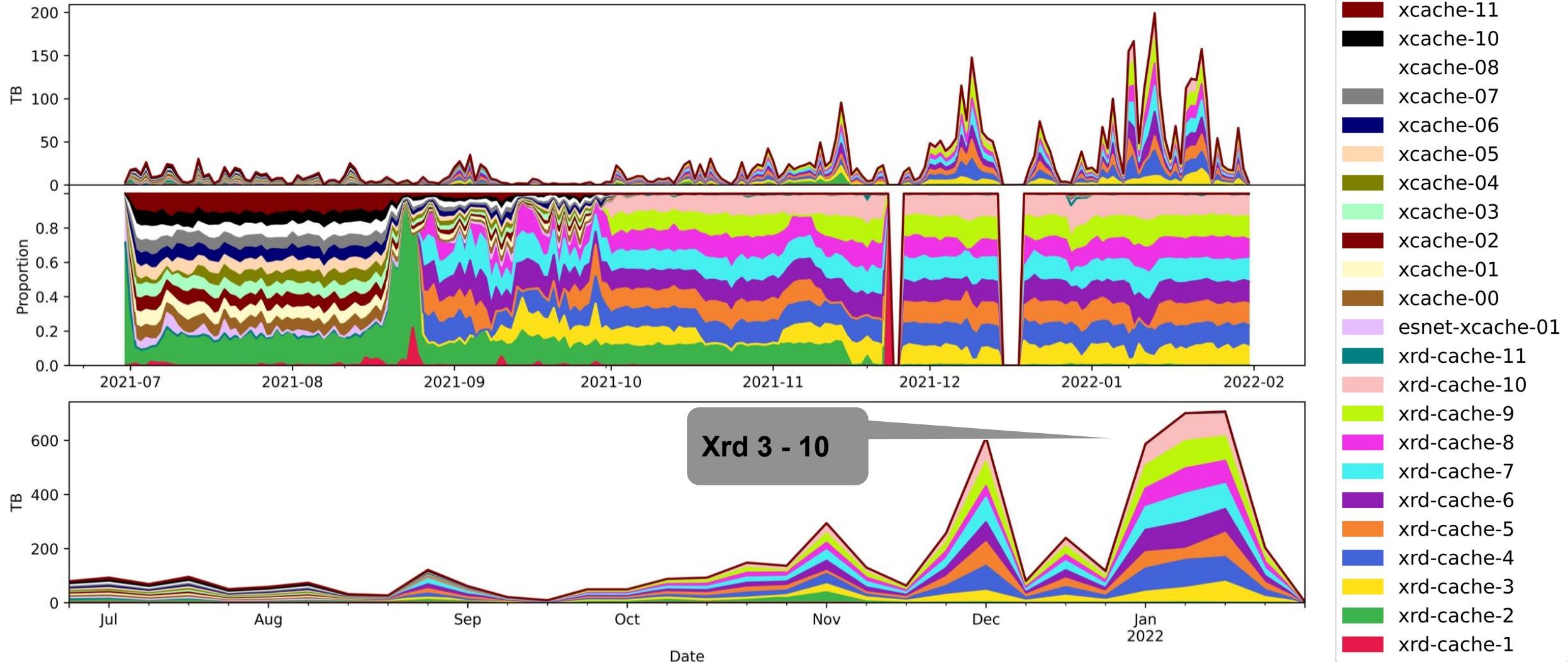


Daily Shared Data Size

Dramatically Reduced Since Mid Sept 2021



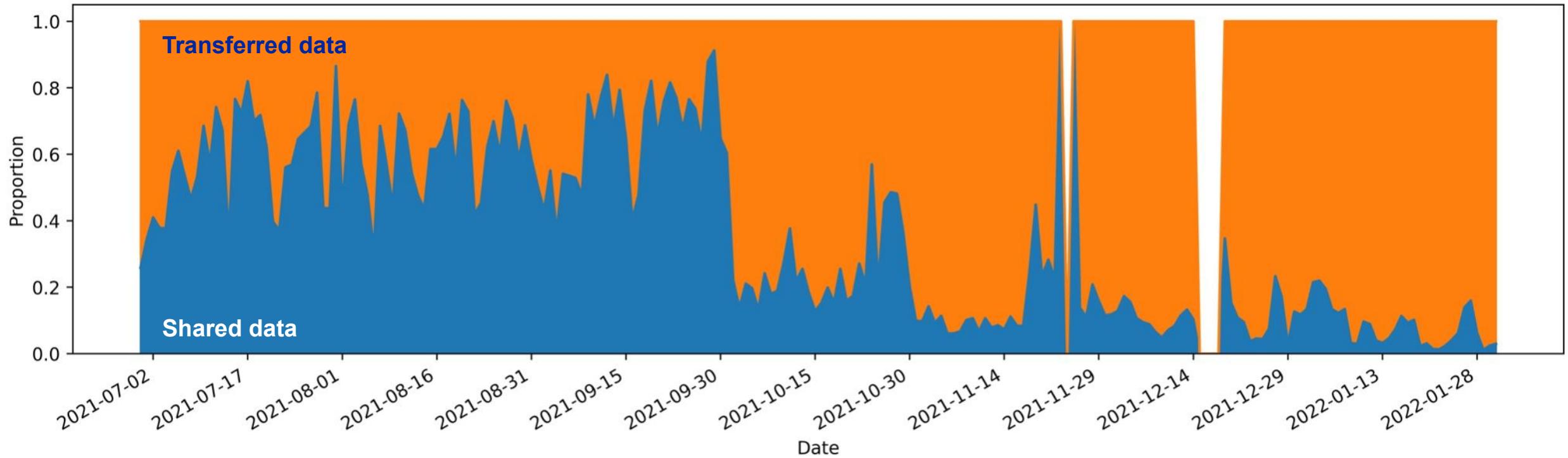
Much More Data Transferred in December and January



SoCal Repo file request steps

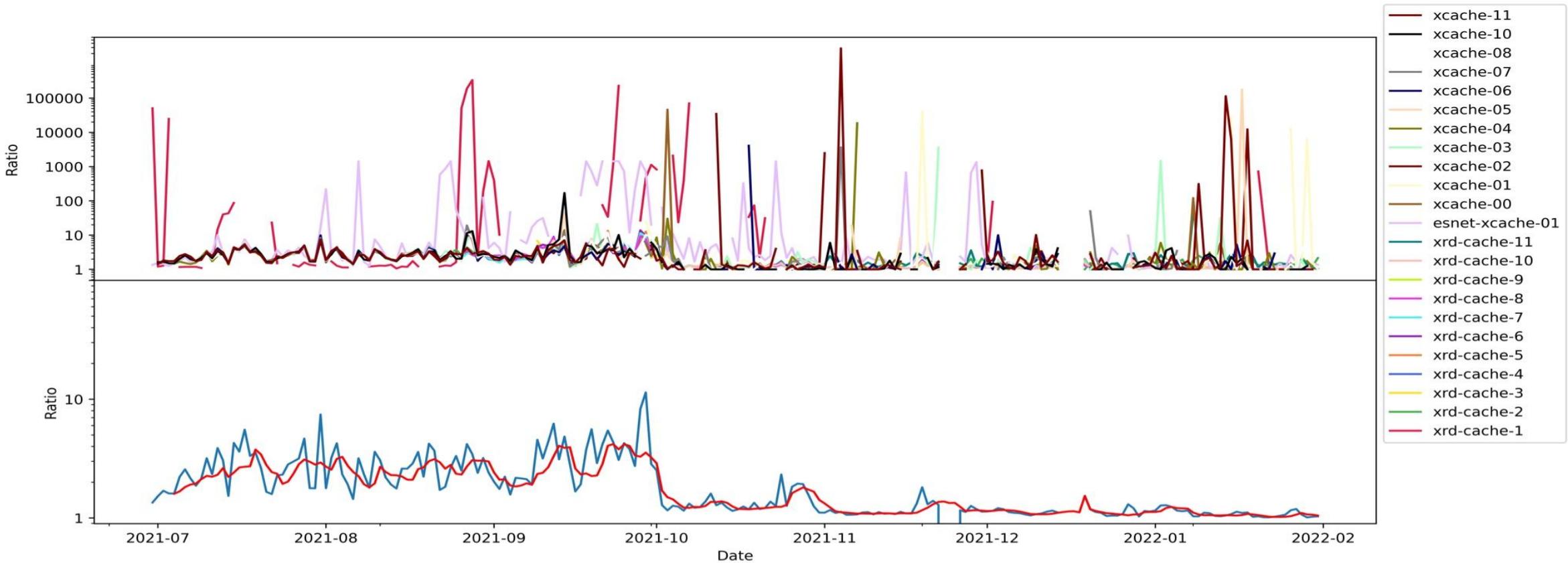
- "Trivial File Catalogue" (TFC) handles user requests
 - "Local redirector" knows all caches
 - If cache hit, local redirector routes to the node
 - if cache miss, an XRootD client to fetch the file from the national XRootD data federation
- Handling cache miss
 - Cache miss file goes to nodes with empty space first
 - nodes with empty spaces receive most of data accesses
 - cache miss goes to empty space
 - cache hits mostly on newly transferred data, which are previous cache misses
 - when new nodes added
 - new Caltech nodes (Xrd 3 - 8, 11) added around Aug 26th, 2021
 - new Caltech nodes (Xrd 9 - 10) added around Sept 30th, 2021
 - Delete old data if space are full
 - After the system running for sufficient time without adding new nodes
 - All cache nodes divide the data access more evenly

Proportion of Data (Size) Transferred vs Shared



The sudden drop of proportion of data transfer size since Oct 2021 is due to several users requested large amount of new files.

Network Traffic Volume Reduction Over Time



network traffic demand reduction rate = (total cache hit size + total cache miss size) / (total cache miss size)

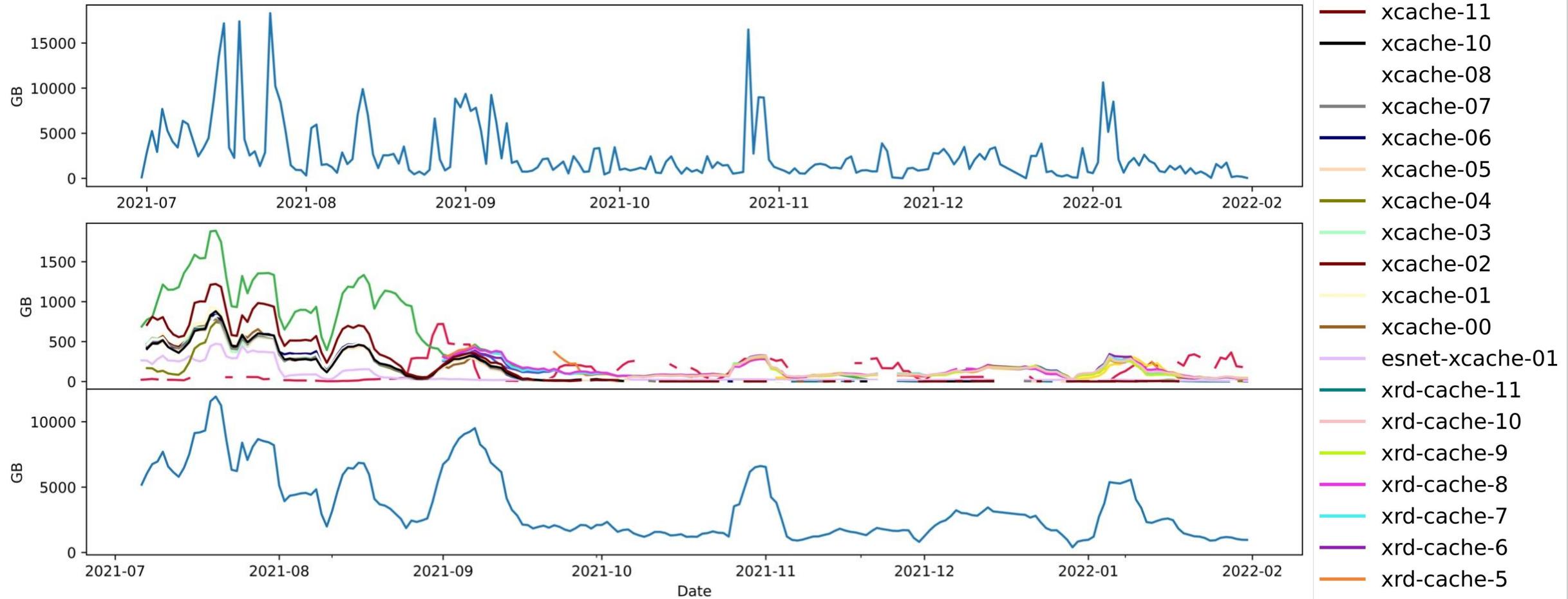
Avg traffic volume reduction for the whole period: 1.30

Avg traffic volume reduction from July 2021 - Sept 2021: 2.35

Avg traffic volume reduction from Oct 2021 - Jan 2021: 1.11

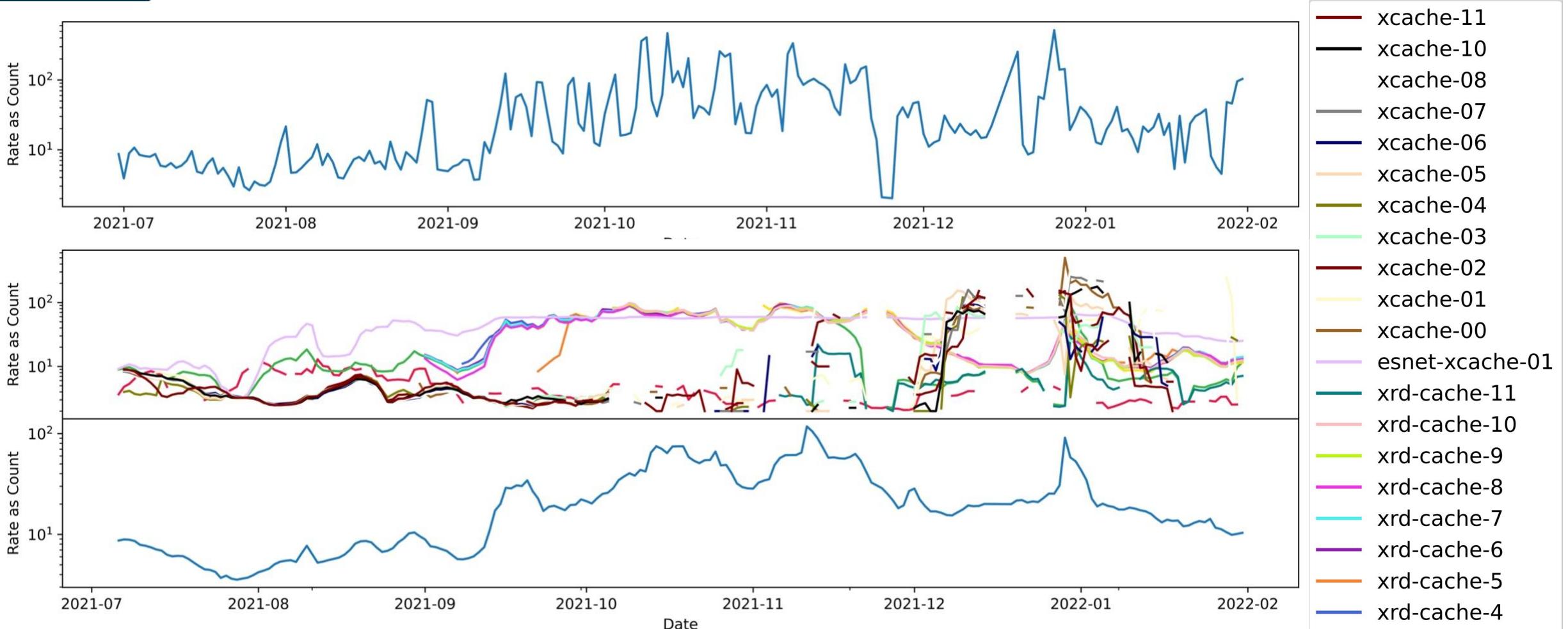


Total Volume of Data Re-use Is Somewhat Consistent Over Time



Data Reuse: the re-access of the same data file without transferring within the same day

Number of File Re-used Per Day (in log scale)

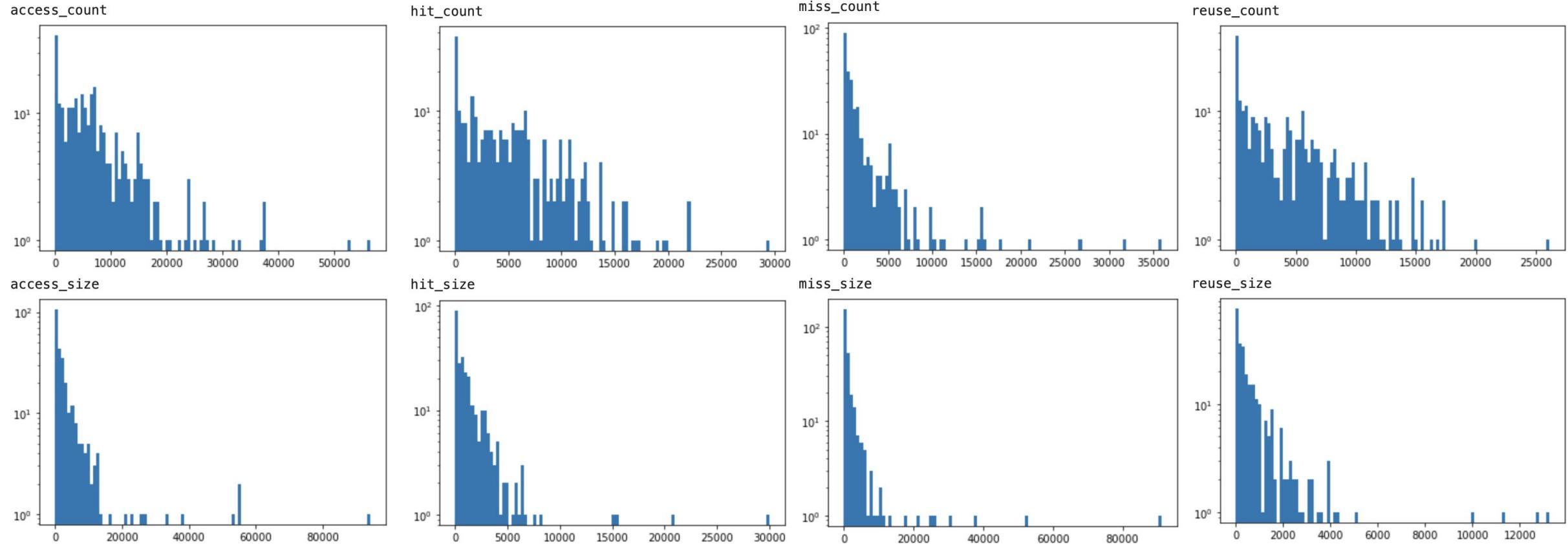


**the number of times that the files have been reused in a single day,
calculated by $(\text{Total Data Reused Count}) / (\text{Number of Unique Reused Files})$**

xcache-11
xcache-10
xcache-08
xcache-07
xcache-06
xcache-05
xcache-04
xcache-03
xcache-02
xcache-01
xcache-00
esnet-xcache-01
xrd-cache-11
xrd-cache-10
xrd-cache-9
xrd-cache-8
xrd-cache-7
xrd-cache-6
xrd-cache-5
xrd-cache-4
xrd-cache-3
xrd-cache-2
xrd-cache-1

MODELING AND PREDICTING CACHE UTILIZATION

Distribution of Daily Data

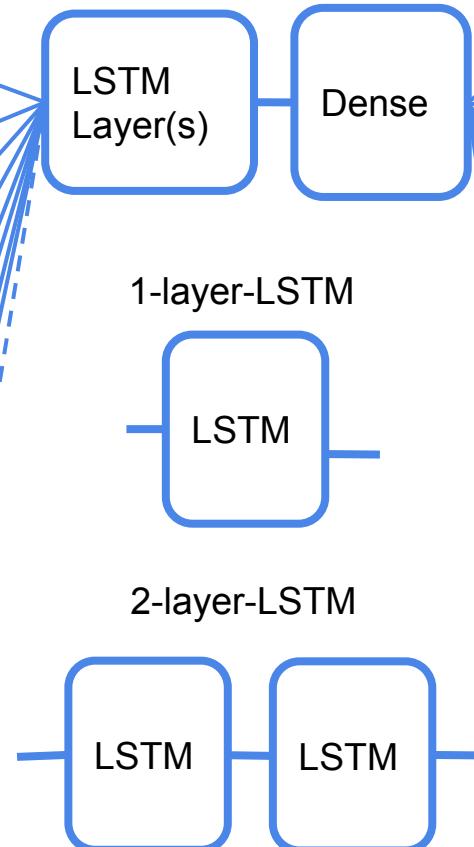
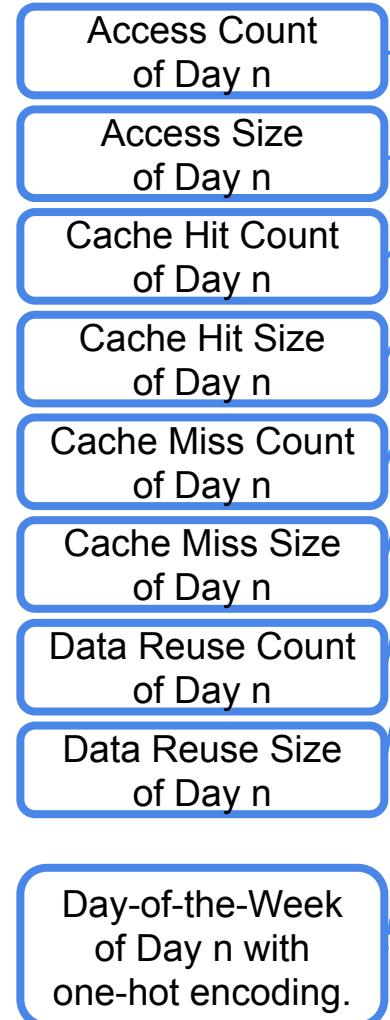


Most features have highly skewed distributions, with small number of very large values

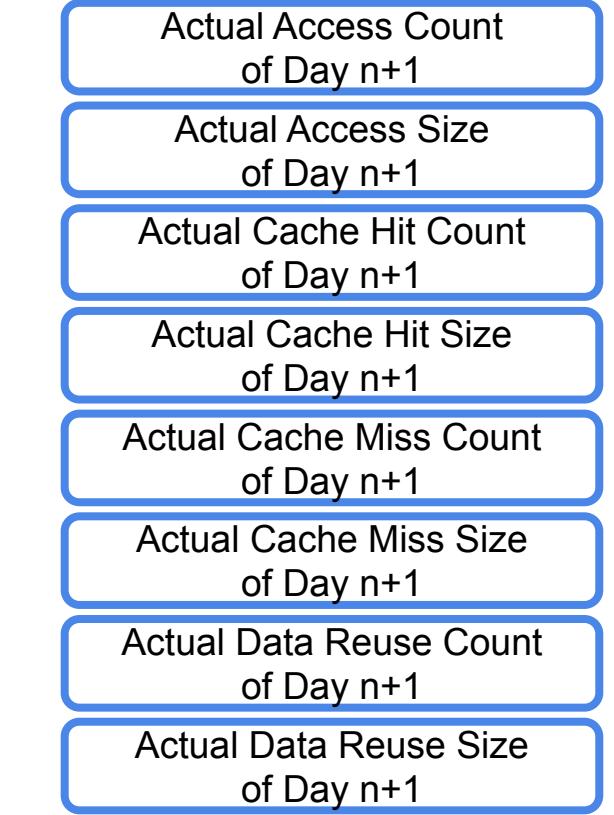
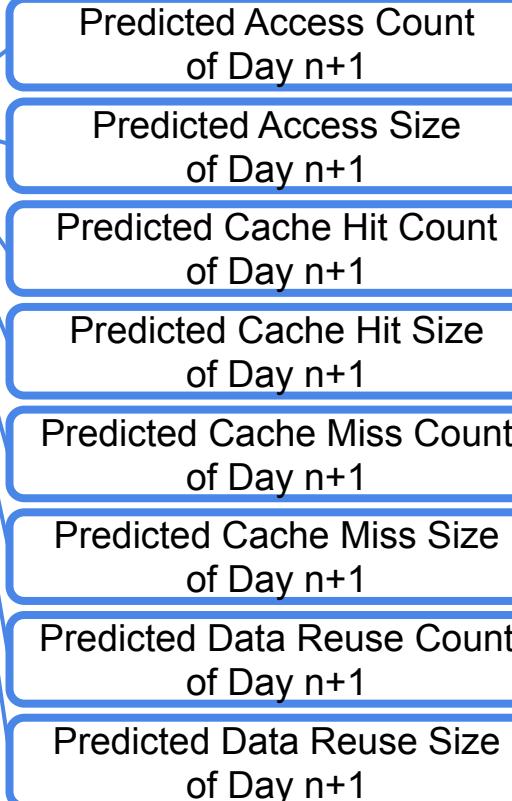
80% Training July 1, 2021 to Dec. 16, 2021, 20% Testing Dec. 19, 2021 to Jan. 29, 2022

Model Construction

Input Vector of size 14
(8 if Day-of-the-Week excluded)



Output Vector of size 8



Loss Function: RMSE
Between Predicted Value of Day n+1 and Actual Value of Day n+1

Hyperparameters for daily LSTM model

Explored Parameter:

Parameter	values
# of first layer LSTM unit	16, 32, 64, 128, 256
# of second layer LSTM unit	0, 16, 32, 64, 128, 256
first layer activation function	tanh, relu
second layer activation function	tanh, relu
dropout rate	0, 0.04, 0.1, 0.15
# of epochs	5, 10, 15, 25, 50, 75, 100

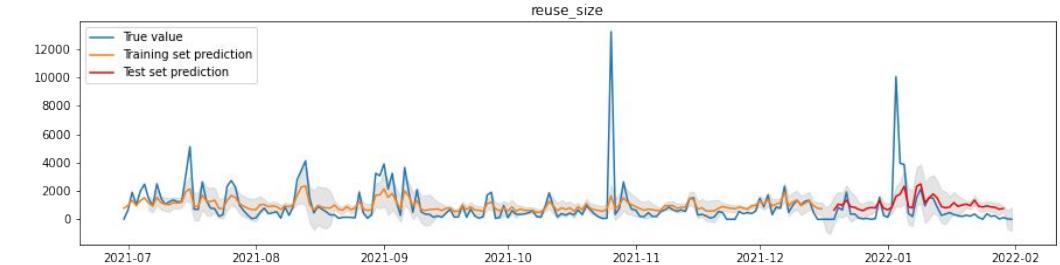
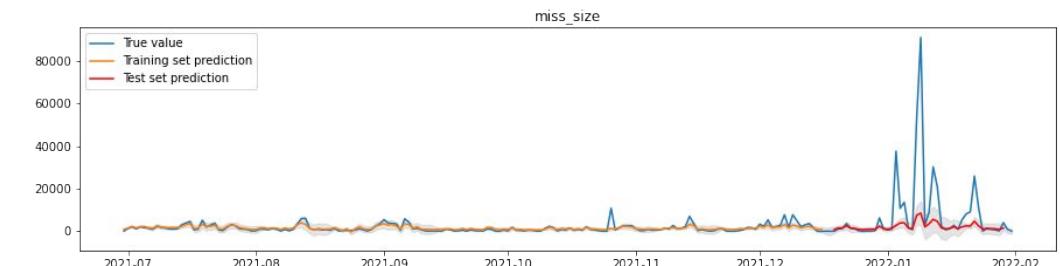
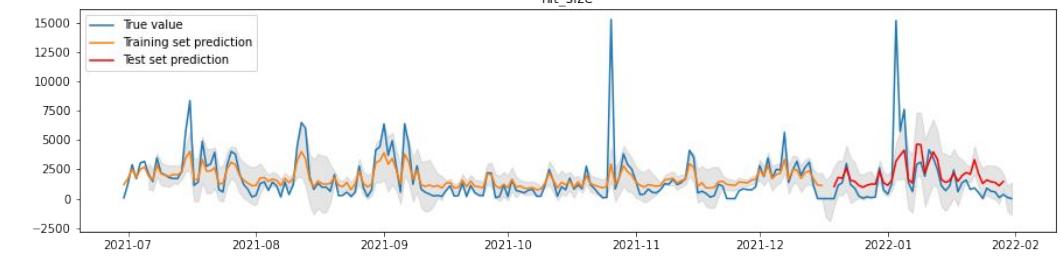
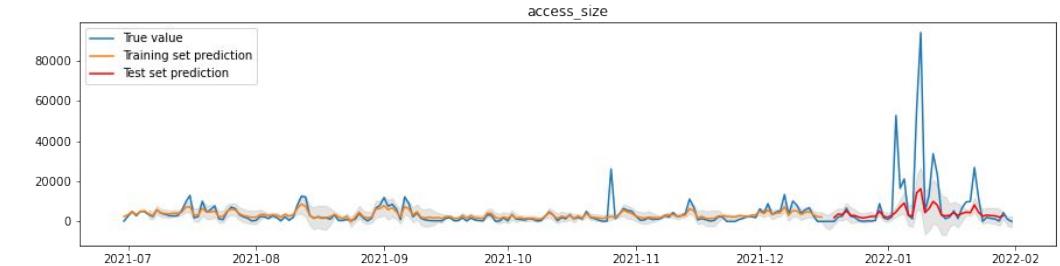
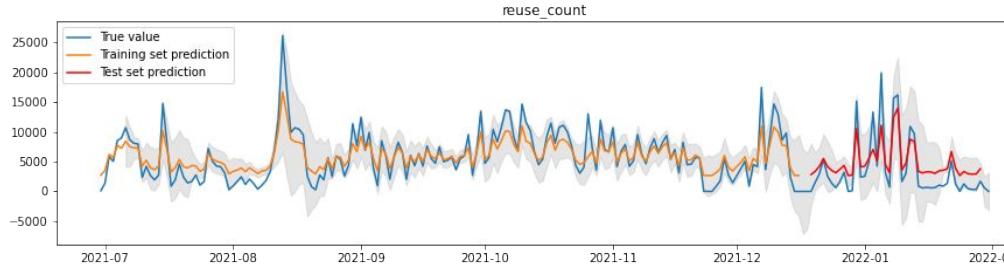
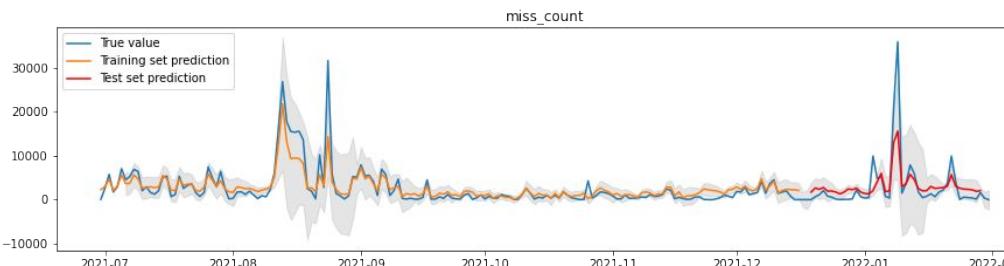
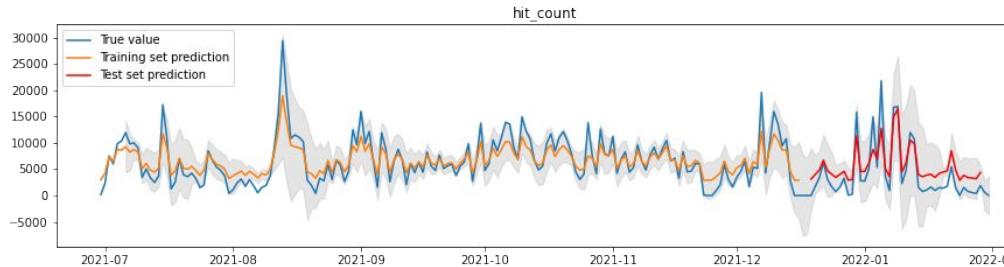
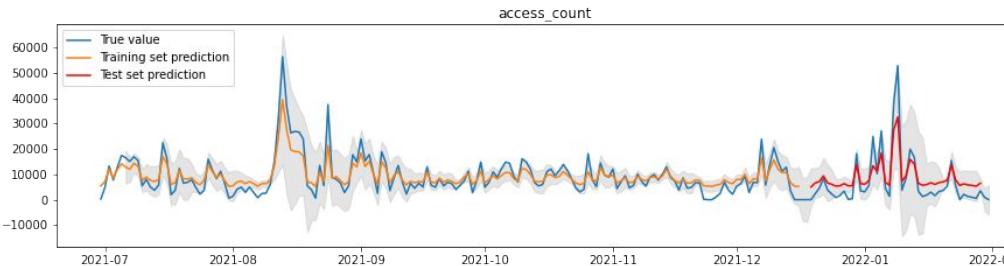
Model Parameter:

	# of LSTM units	activation function	dropout rate	# of training epoch
values	128	tanh	0.04	50

RMSE of Daily LSTM model

	Without day-of-week		With day-of-week		
	Training RMSE	Test RMSE	Train RMSE	Test RMSE	Accuracy
Access Count	3,861.14	4,944.34	3,492.61	4,220.19	0.93
Access Size	2,480.61	16,621.57	2,612.90	16,571.21	0.85
Cache Hit Count	2,459.72	3,158.99	2,179.03.99	2,917.99	0.95
Cache Hit Size	1,425.66	2,144.92	1,375.42	2,154.87	0.85
Cache Miss Count	2,261.62	2,954.13	2,302.29	2,970.10	0.91
Cache Miss Size	1,265.84	17,324.68	1,298.15	16,426.95	0.90
Data Reuse Count	2,224.82	3,066.91	2,063.65	2,646.69	0.93
Data Reuse Size	1,135.80	1,482.21	1,099.14	1,466.38	0.73

Daily LSTM model results





Hyperparameters for daily LSTM model with 7 day moving average

Explored Parameters:

Parameter	values
# of first layer LSTM unit	16, 32, 64, 128, 256
# of second layer LSTM unit	0, 16, 32, 64, 128, 256
first layer activation function	tanh, relu
second layer activation function	tanh, relu
dropout rate	0, 0.04, 0.1, 0.15
# of epochs	5, 10, 15, 25, 50, 75, 100

Model Parameters:

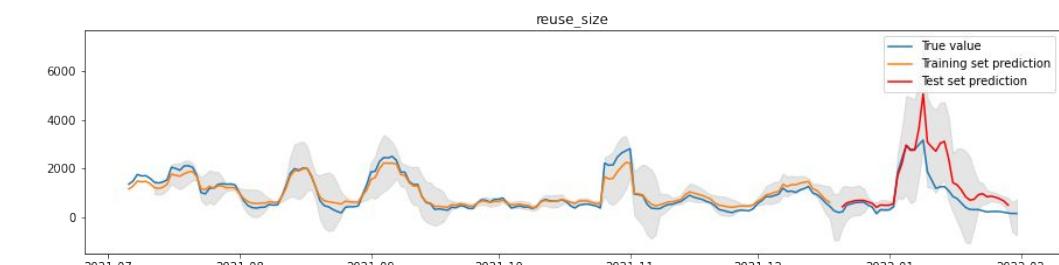
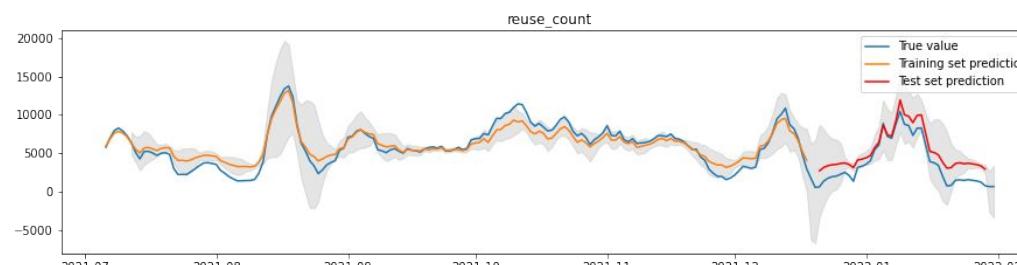
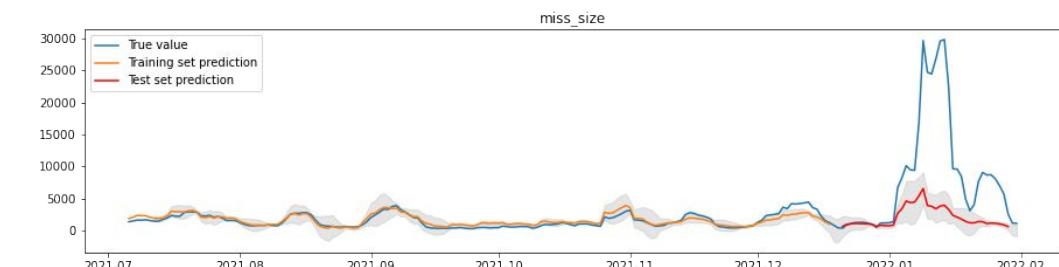
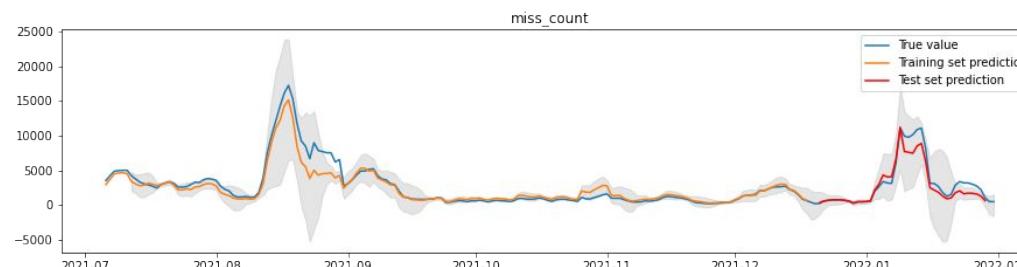
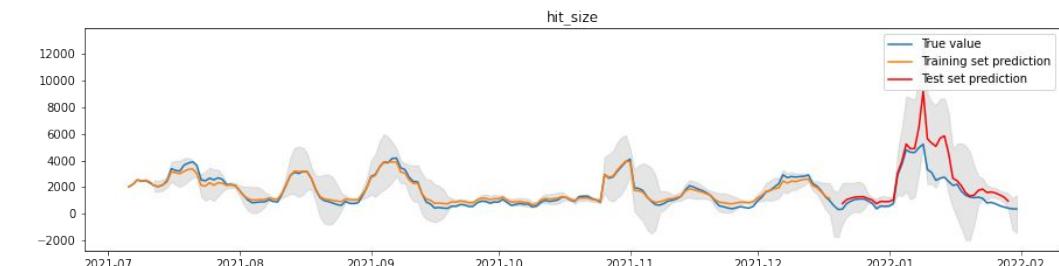
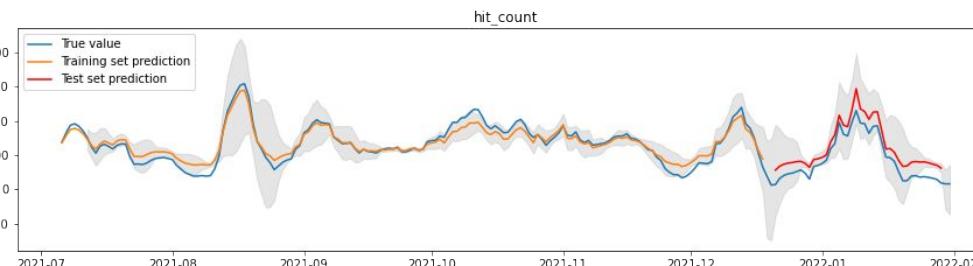
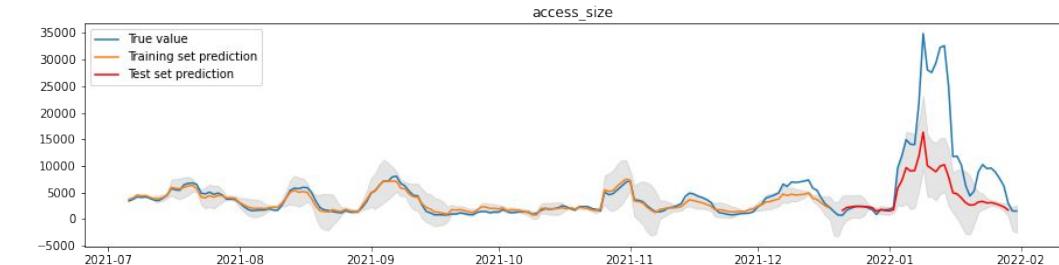
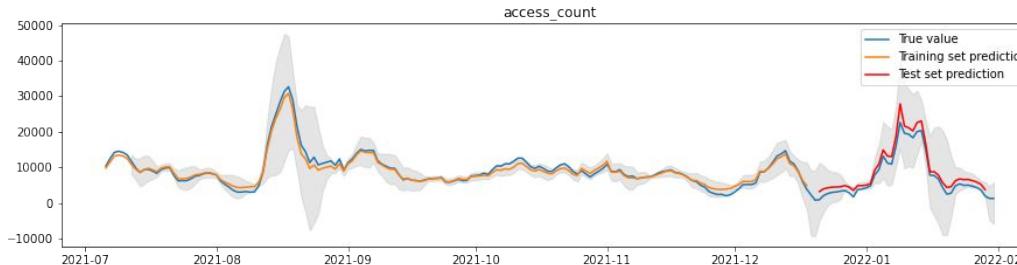
	# of LSTM units	activation function	dropout rate	# of training epoch
values	128	tanh	0.00	100

Daily LSTM model results with 7 day moving average

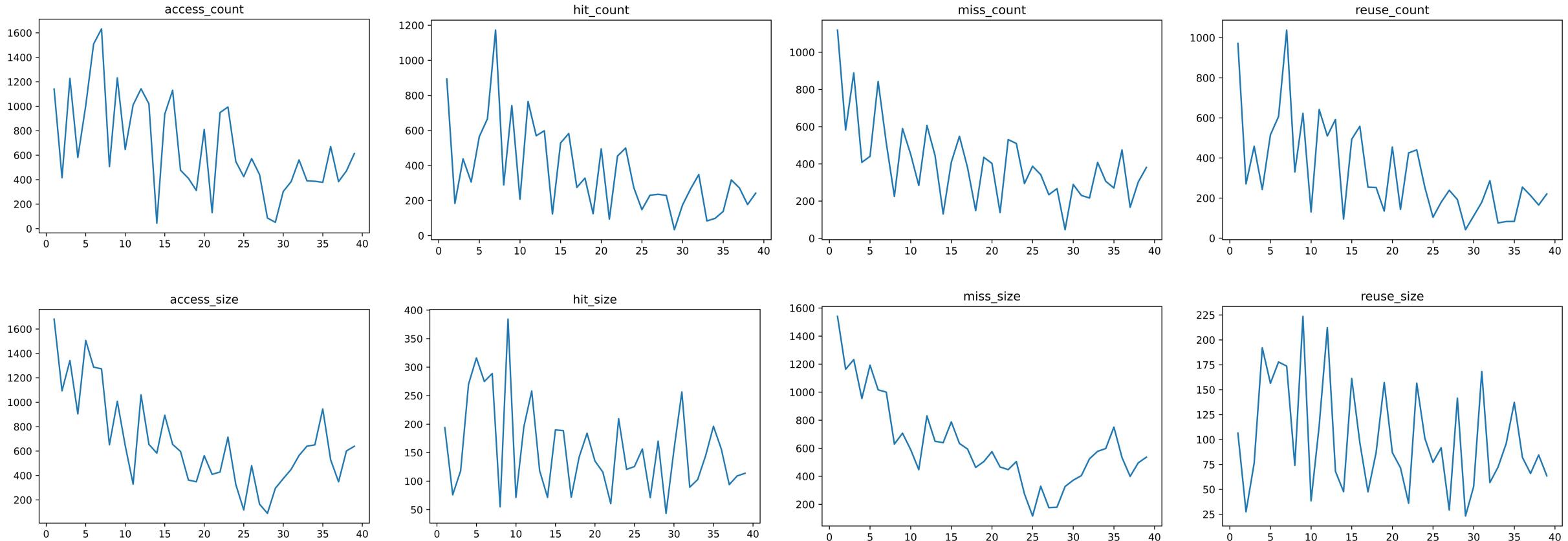
	Train RMSE of MA LSTM model	Test RMSE of MA LSTM model <i>(reduction compare to Daily LSTM Model)</i>	Accuracy	Test RMSE of Daily LSTM model
Access Count	1,122.15	2,169.72 (48.6%)	0.93	4,220.19
Access Size	744.56	7,729.04 (53.6%)	0.83	16,571.21
Cache Hit Count	829.23	2025.21 (30.6%)	0.88	2,917.99
Cache Hit Size	223.00	1,573.72 (27.1%)	0.91	2,154.87
Cache Miss Count	1,127.30	781.83 (73.0%)	0.86	2,970.10
Cache Miss Size	612.94	9616.83 (58.5%)	0.77	16,426.95
Data Reuse Count	808.80	1,228.71 (53.6%)	0.87	2,646.69
Data Reuse Size	208.27	812.33 (44.6%)	0.92	1,466.38



Daily LSTM model results with 7 day moving average



Periodogram of Daily data





Summary

- **Southern California Petabyte Scale Cache**
 - Reduced the redundant data transfers, saved network traffic volume
 - Network traffic savings 2.35X during normal operations
- **Daily Cache Utilization can be predicted by LSTM**
 - LSTM can achieve about 88.4% accuracy
 - LSTM works better with moving average data, as there are less extreme values
- **Further studies**
 - Data shared ratio drops since Oct 2021
 - LSTM models with more data

Backup

Summary data accesses Jan-May 2021

	Number of accesses	Data transfer size (TiB)	Shared data size (TiB)	Percentage of shared data size
Jan 2021	1,402,696	269.62	269.62	51.42%
Feb 2021	1,078,545	279.33	173.69	38.34%
Mar 2021	1,166,506	319.77	226.57	41.47%
Apr 2021	365,068	81.85	72.04	46.81%
May 2021	757,555	216.50	186.29	46.24%
Total	4,770,370	1152.14	928.21	44.62%
Daily average	32,451.50	7.84	6.31	

- Data transfer size (= first time data access size, cache misses): From remote sites to the local node cache
- Shared data access size (= repeated data accesses, cache hits, network bandwidth savings): From the local node cache to the application, excluding the first time accesses (data transfers)



Summary data accesses May - Dec 2020

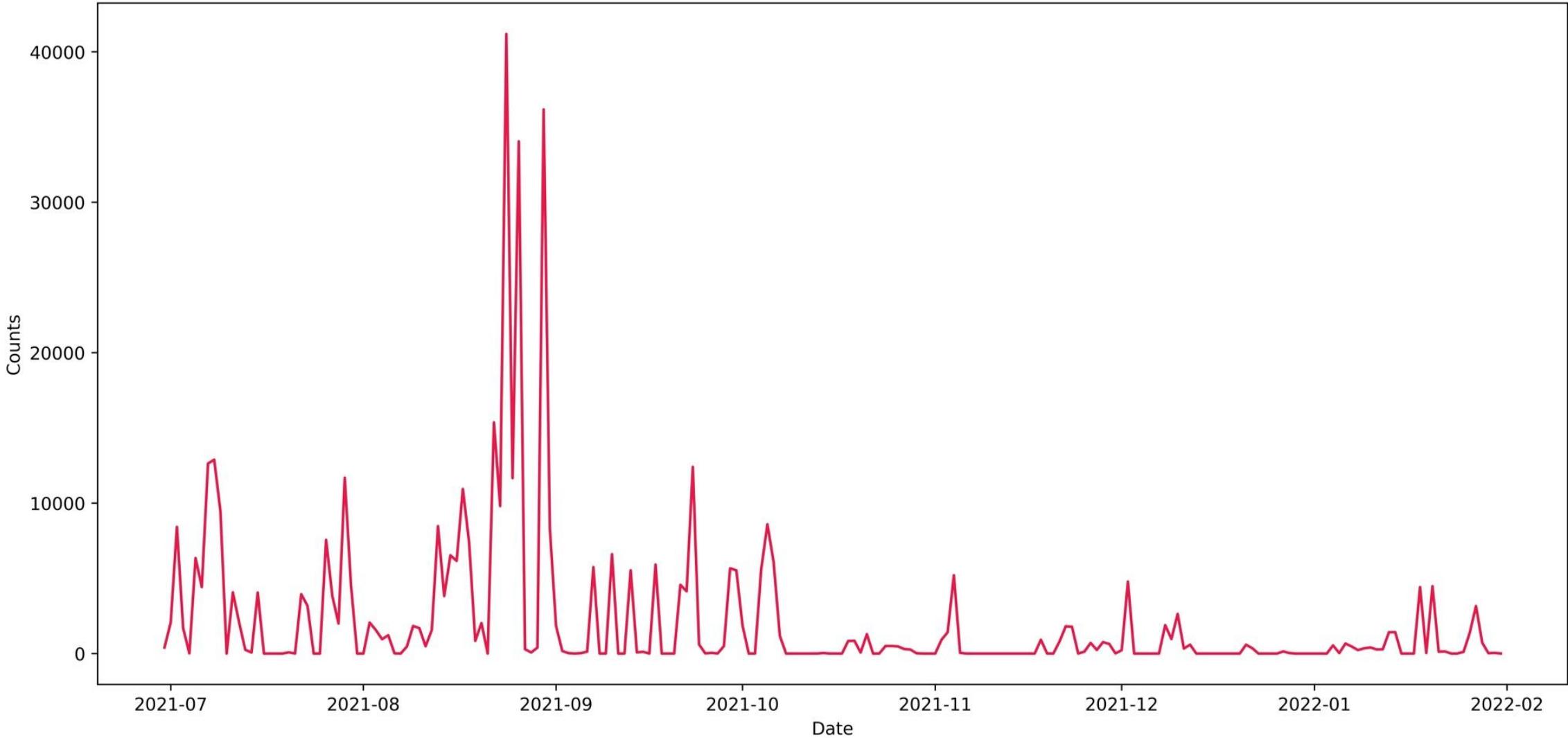
(ESnet node only)

	Number of accesses	Data transfer size (GB)	Shared data access size (GB)
May 4-31, 2020	189,984	30,150.50	47,986.56
June 2020	215,452	40,835.23	55,929.47
July 2020	205,478	33,399.81	66,457.35
Aug 2020	203,806	30,819.80	68,723.19
Sep 2020	165,910	10,153.97	38,036.19
Oct 2020	306,118	22,723.93	45,614.91
Nov 2020	276	3.33	47
Dec 2020	8514	1236.81	4523
Total (May-Oct)	1,286,748	168,083.27	322,747.67
Daily average	9,674.79	1,263.8	2,426.67

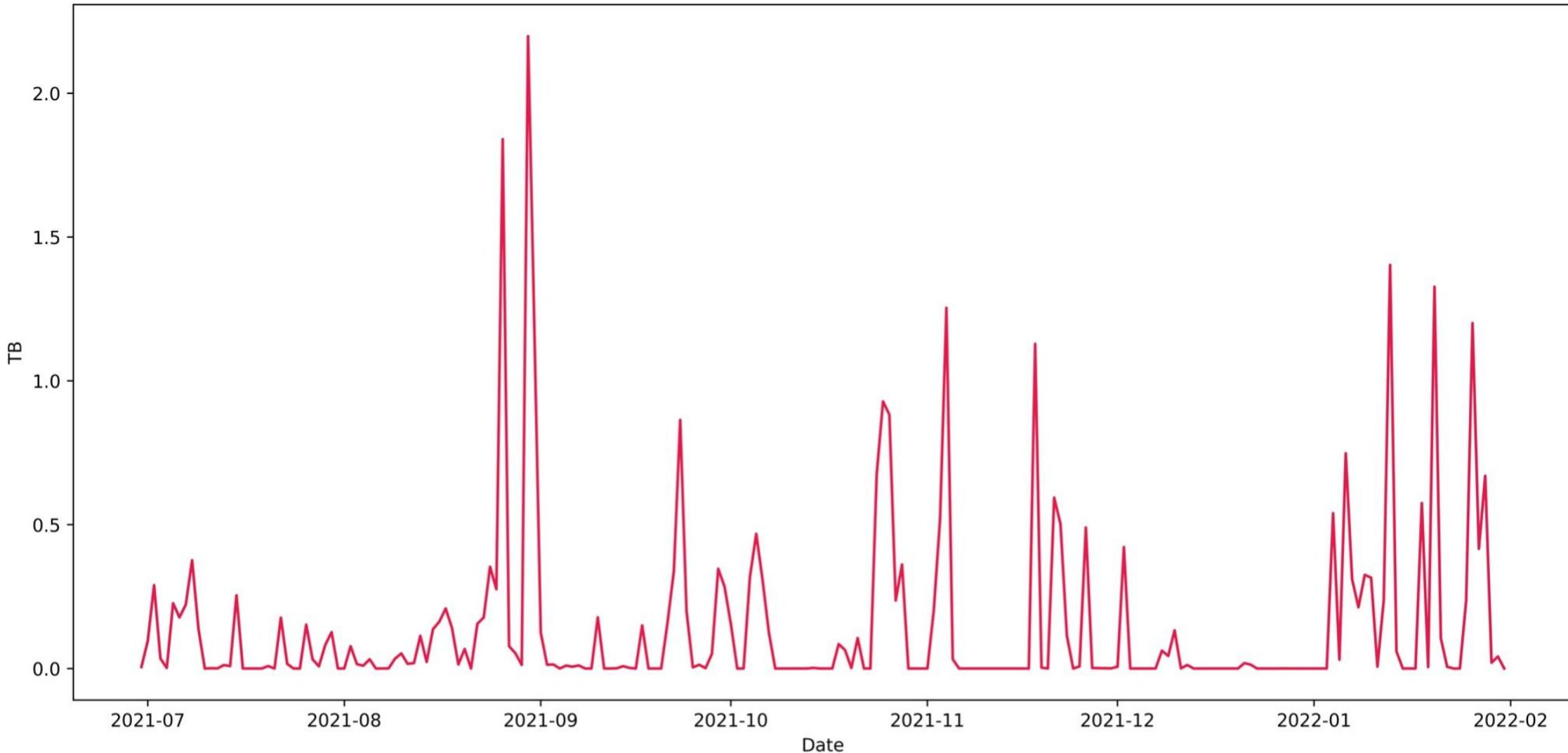
- Data transfer size (= first time data access size, cache misses): From remote sites to the local node cache
- Shared data access size (= repeated data accesses, cache hits, network bandwidth savings): From the local node cache to the application, excluding the first time accesses (data transfers)
- Total number of active days until the end of Oct 2020: 133



Daily number of data accesses for xrd-cache-1

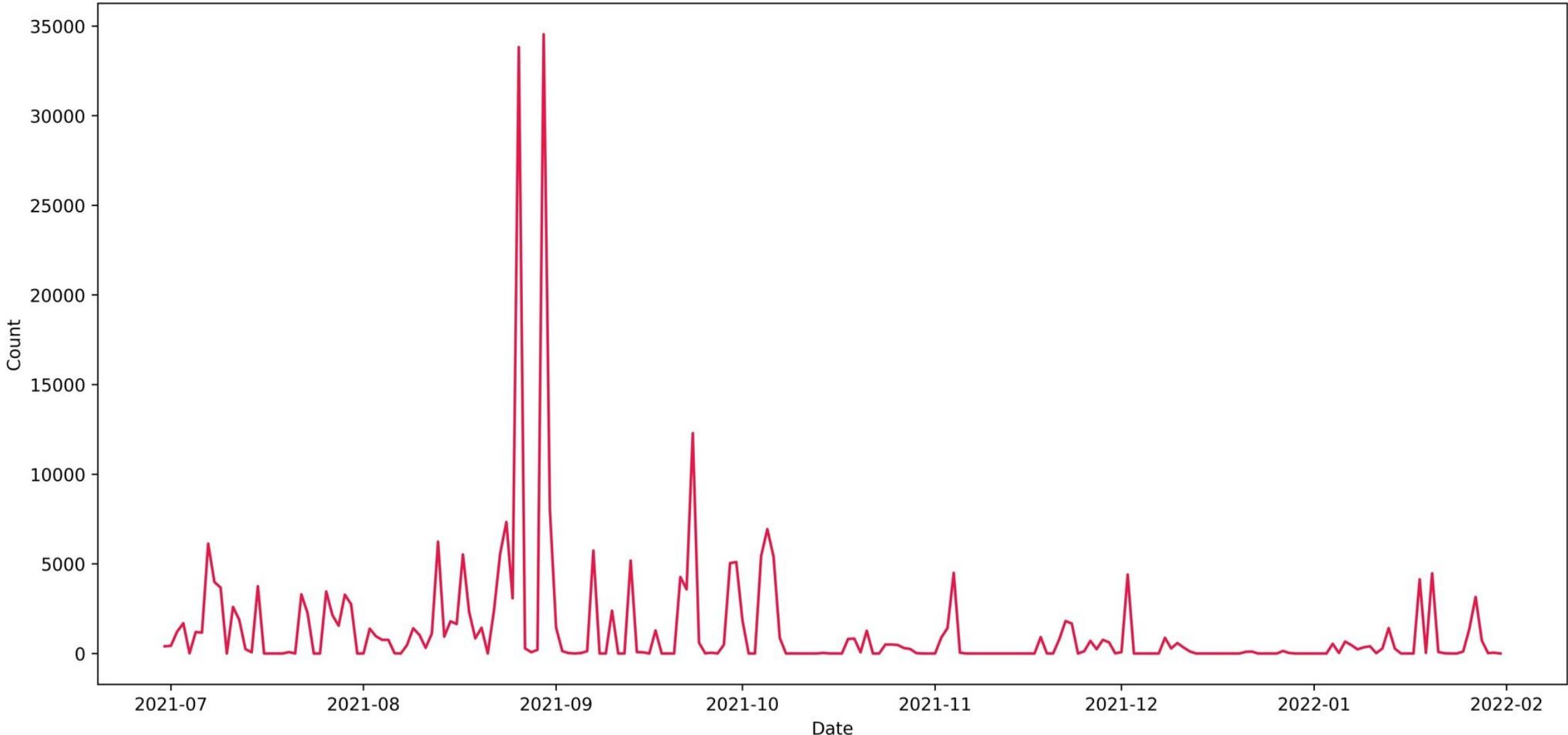


Daily number of data access sizes of xrd-cache-1



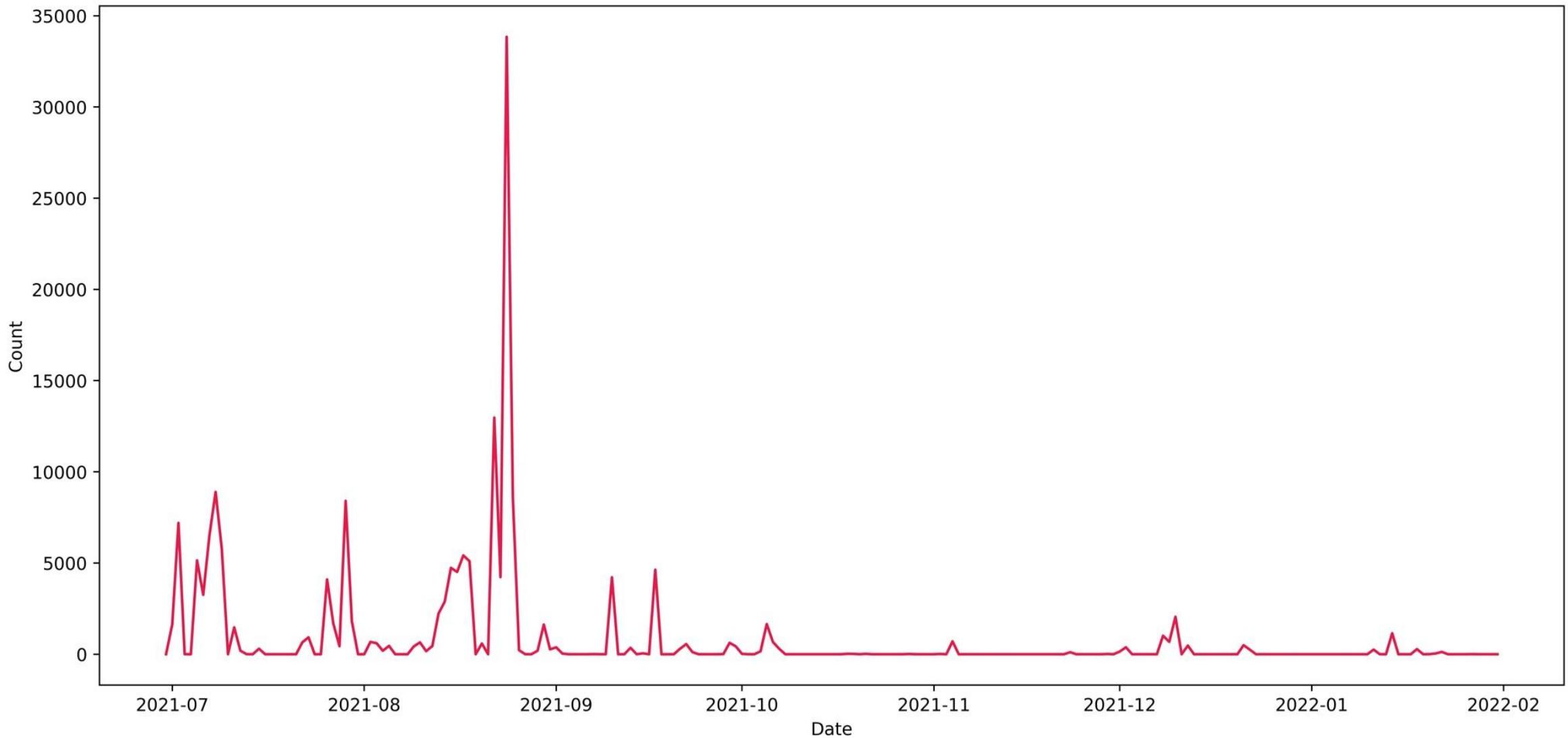


Daily number of cache hits of xrd-cache-1



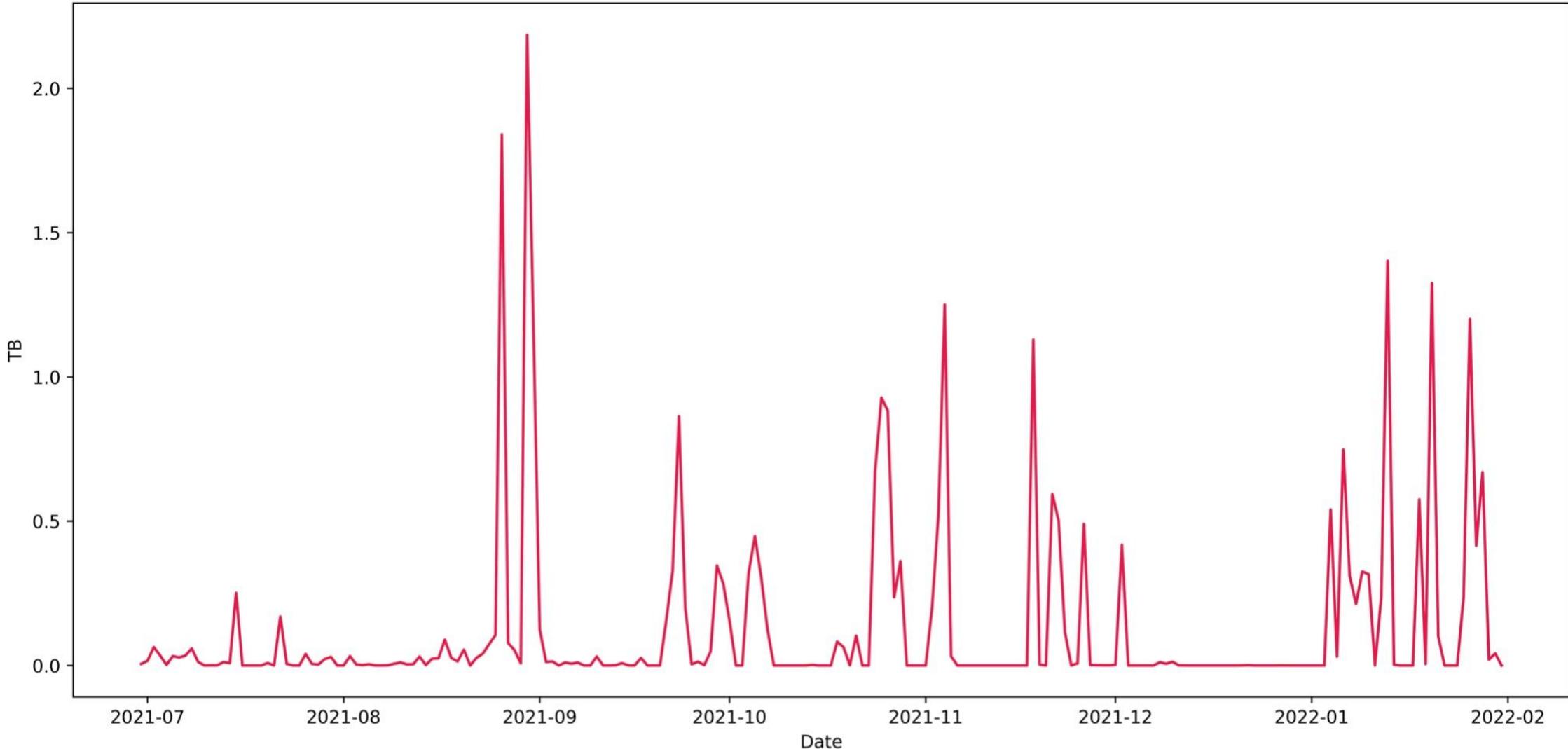


Daily number of cache misses of xrd-cache-1



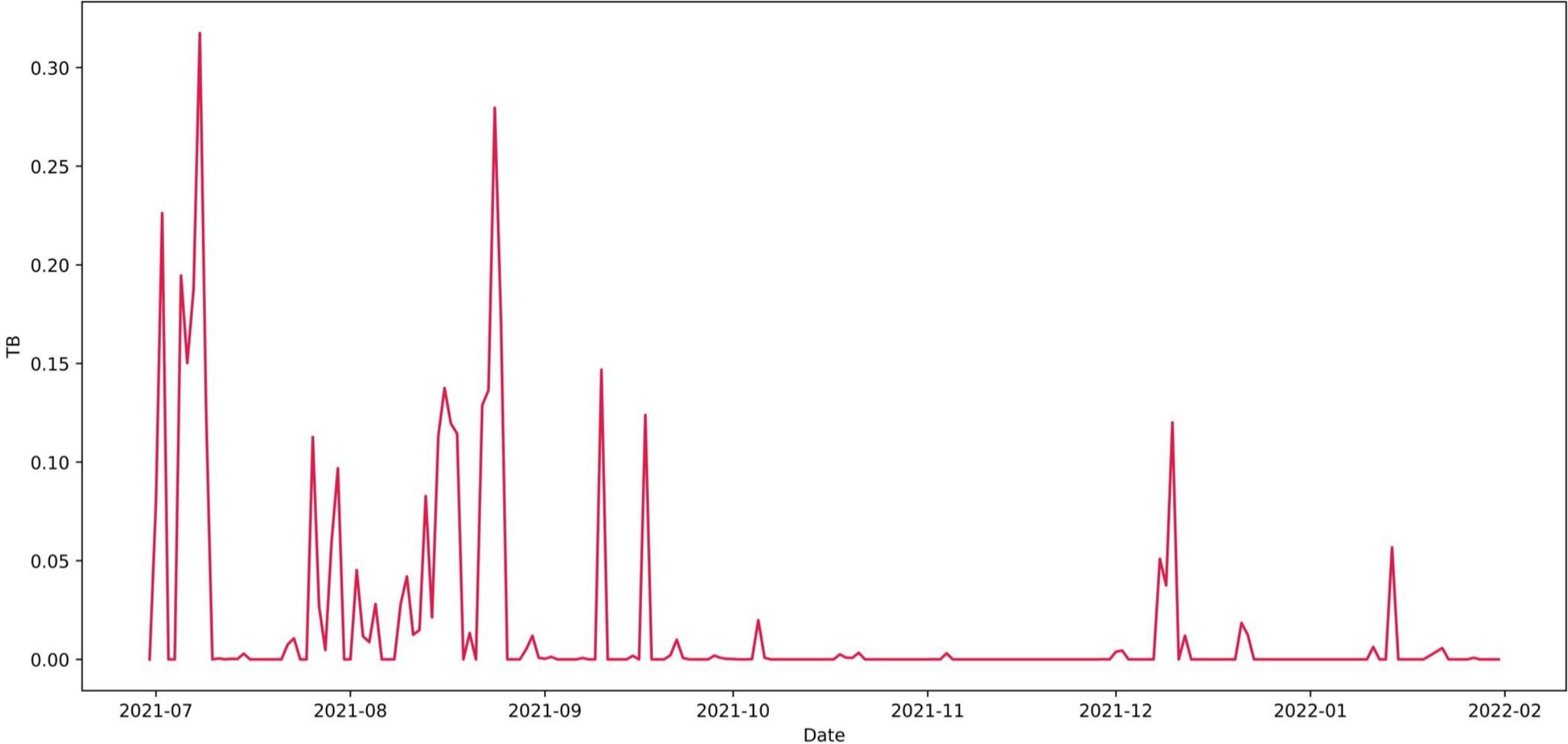


Daily cache hits size (shared data size) of xrd-cache-1





Daily cache misses size (data transfer size) of xrd-cache-1





Weekly number of data accesses

index	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnet01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache09	Xcache10	Xcache11	Total
2021-06-27	12588	29368	0	0	0	0	0	0	0	0	0	15278	14145	13987	14173	13655	5246	13165	13439	13437	13650	13718	23115	208964	
2021-07-04	49786	48211	0	0	0	0	0	0	0	0	0	19345	23388	23406	23292	23281	2901	22690	22808	22744	19337	22645	35612	359446	
2021-07-11	6444	43032	0	0	0	0	0	0	0	0	0	14895	15603	17030	14813	15283	10121	14515	15217	15548	11338	15149	20269	229257	
2021-07-18	7200	33505	0	0	0	0	0	0	0	0	0	11000	13615	14266	13843	13615	13494	13190	14055	13748	13928	13849	25162	214470	
2021-07-25	29616	29870	0	0	0	0	0	0	0	0	0	8146	9734	9592	9752	9458	9516	9348	9657	9403	9608	9533	16856	180089	
2021-08-01	6272	38397	0	0	0	0	0	0	0	0	0	13073	7640	7856	7845	7656	7799	7547	7930	7589	7647	7242	13049	147542	
2021-08-08	24384	62923	0	0	0	0	0	0	0	0	0	21883	20417	20179	20794	20261	20269	19337	19383	20012	20462	19799	32867	342970	
2021-08-15	42748	62261	0	0	0	0	0	0	0	0	0	14581	9410	8981	8760	8879	8883	8451	7966	8538	8647	8677	14346	221128	
2021-08-22	97458	42579	0	13427	13427	13444	13502	13388	0	0	0	9861	0	1349	1057	1234	1247	1117	1159	1087	1448	1155	1294	229233	
2021-08-29	46483	55438	0	48082	52896	54440	55656	52894	0	0	0	9700	6746	9691	9035	9578	9209	8111	8886	8763	9899	8688	11618	475813	
2021-09-05	12476	40126	13923	17744	16349	38769	40118	38603	0	0	0	8120	3640	4349	3707	4042	3732	3001	3745	3472	4575	3498	4456	268445	
2021-09-12	11637	24927	24818	23933	0	24894	24897	25037	0	0	0	9886	369	517	356	394	375	339	374	329	554	389	388	174413	
2021-09-19	21768	23353	23195	23242	13838	23275	23372	23276	0	0	0	10036	415	572	425	501	438	390	423	396	577	435	223	190150	
2021-09-26	13551	24611	23627	24568	24759	24577	24661	24382	11692	11762	0	9728	196	265	234	253	213	191	190	211	466	197	268	220602	
2021-10-03	21429	22905	22741	22816	22893	22888	22918	23005	22778	22747	0	10038	25	26	43	19	31	15	11	24	34	40	35	237461	
2021-10-10	33	25520	24716	25244	25170	25141	25440	25352	24915	24822	0	9636	24	23	14	36	16	18	10	7	82	22	182	236423	
2021-10-17	3536	26019	1838	25791	25834	25791	25910	25950	25708	25717	0	9908	10	13	6	13	14	14	8	9	46	12	104	222251	
2021-10-24	1558	31096	0	31203	30739	31073	31299	31007	31001	31045	33	10092	39	81	41	45	44	36	36	46	190	41	179	260924	
2021-10-31	7572	27272	17854	27155	26661	26968	27170	26873	12911	26921	635	10183	29	41	57	16	15	8	46	52	162	28	143	238772	
2021-11-07	1	34815	33415	34636	13176	34634	34613	33651	28914	34649	3184	9912	52	84	68	89	44	48	96	32	637	41	468	297259	
2021-11-14	1721	4246	27857	28894	0	28803	29022	28575	28774	28758	1626	10010	9	35	27	18	12	12	47	4	59	18	14	218541	
2021-11-21	5426	554	9261	9736	5926	9661	9848	9675	9574	9620	490	4396	11	20	12	20	9	2	3	2	23	9	12	84290	
2021-11-28	5647	2377	24575	26290	26092	26305	26114	25690	25779	26180	3088	9918	136	317	92	502	63	175	69	27	184	57	347	230024	
2021-12-05	6404	8477	34053	50657	49570	43359	49558	35094	49683	49604	8433	10588	1488	1025	1117	1429	1304	1960	1535	1996	2684	1604	3593	415215	
2021-12-12	0	1036	7407	8860	8782	8642	8777	8059	8530	8746	1119	2249	32	45	274	219	27	146	131	489	366	120	952	75008	
2021-12-19	945	767	23434	25632	25402	25244	25721	21654	25342	25413	737	8957	27	20	49	30	27	26	12	268	34	24	15	209780	
2021-12-26	168	3085	10888	13289	13640	12507	12787	13210	13299	16445	2035	7117	2996	669	669	621	339	1189	299	2549	5170	1469	234	134674	
2022-01-02	2278	7240	35797	49265	37171	47934	49045	44315	48461	46850	2603	9183	1138	521	745	360	222	187	748	357	1402	137	48	386007	
2022-01-09	3793	5335	33514	43897	17558	42837	44195	41110	43125	43329	3524	5884	213	1729	176	151	677	215	194	0	386	250	289	332381	
2022-01-16	9191	1504	34671	38369	38043	37720	38414	36560	38281	38079	1299	5987	14	15	70	8	31	19	18	0	11	8	28	318340	
2022-01-23	5438	426	12054	13493	13208	13334	13457	13158	13231	13373	500	3054	8	16	13	12	14	10	6	0	15	9	4	114833	
2022-01-30	0	8	375	389	415	413	415	369	412	416	7	252	0	1	0	0	0	1	0	0	0	0	0	3473	



Weekly number of data accesses in proportion

index	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnet01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache10	Xcache11
2021-06-27	6.024	14.054	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.311	6.769	6.693	6.783	6.535	2.510	6.300	6.431	6.430	6.532	6.565	11.062
2021-07-04	13.851	13.413	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.382	6.507	6.512	6.480	6.477	0.807	6.312	6.345	6.328	5.380	6.300	9.907
2021-07-11	2.811	18.770	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.497	6.806	7.428	6.461	6.666	4.415	6.331	6.638	6.782	4.946	6.608	8.841
2021-07-18	3.357	15.622	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.129	6.348	6.652	6.455	6.348	6.292	6.150	6.553	6.410	6.494	6.457	11.732
2021-07-25	16.445	16.586	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.523	5.405	5.326	5.415	5.252	5.284	5.191	5.362	5.221	5.335	5.293	9.360
2021-08-01	4.251	26.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.861	5.178	5.325	5.317	5.189	5.286	5.115	5.375	5.144	5.183	4.908	8.844
2021-08-08	7.110	18.347	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.380	5.953	5.884	6.063	5.908	5.910	5.638	5.652	5.835	5.966	5.773	9.583
2021-08-15	19.332	28.156	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.594	4.255	4.061	3.962	4.015	4.017	3.822	3.602	3.861	3.910	3.924	6.488
2021-08-22	42.515	18.575	0.000	5.857	5.857	5.865	5.890	5.840	0.000	0.000	0.000	4.302	0.000	0.588	0.461	0.538	0.544	0.487	0.506	0.474	0.632	0.504	0.564
2021-08-29	9.769	11.651	0.000	10.105	11.117	11.441	11.697	11.117	0.000	0.000	0.000	2.039	1.418	2.037	1.899	2.013	1.935	1.705	1.868	1.842	2.080	1.826	2.442
2021-09-05	4.648	14.948	5.187	6.610	6.090	14.442	14.945	14.380	0.000	0.000	0.000	3.025	1.356	1.620	1.381	1.506	1.390	1.118	1.395	1.293	1.704	1.303	1.660
2021-09-12	6.672	14.292	14.229	13.722	0.000	14.273	14.275	14.355	0.000	0.000	0.000	5.668	0.212	0.296	0.204	0.226	0.215	0.194	0.214	0.189	0.318	0.223	0.222
2021-09-19	11.448	12.281	12.198	12.223	7.277	12.240	12.291	12.241	0.000	0.000	0.000	5.278	0.218	0.301	0.224	0.263	0.230	0.205	0.222	0.208	0.303	0.229	0.117
2021-09-26	6.143	11.156	10.710	11.137	11.223	11.141	11.179	11.052	5.300	5.332	0.000	4.410	0.089	0.120	0.106	0.115	0.097	0.087	0.086	0.096	0.211	0.089	0.121
2021-10-03	9.024	9.646	9.577	9.608	9.641	9.639	9.651	9.688	9.592	9.579	0.000	4.227	0.011	0.011	0.018	0.008	0.013	0.006	0.005	0.010	0.014	0.017	0.015
2021-10-10	0.014	10.794	10.454	10.677	10.646	10.634	10.760	10.723	10.538	10.499	0.000	4.076	0.010	0.010	0.006	0.015	0.007	0.008	0.004	0.003	0.035	0.009	0.077
2021-10-17	1.591	11.707	0.827	11.604	11.624	11.604	11.658	11.676	11.567	11.571	0.000	4.458	0.004	0.006	0.003	0.006	0.006	0.006	0.004	0.004	0.021	0.005	0.047
2021-10-24	0.597	11.918	0.000	11.959	11.781	11.909	11.995	11.884	11.881	11.898	0.013	3.868	0.015	0.031	0.016	0.017	0.017	0.014	0.014	0.018	0.073	0.016	0.069
2021-10-31	3.171	11.422	7.477	11.373	11.166	11.294	11.379	11.255	5.407	11.275	0.266	4.265	0.012	0.017	0.024	0.007	0.006	0.003	0.019	0.022	0.068	0.012	0.060
2021-11-07	0.000	11.712	11.241	11.652	4.432	11.651	11.644	11.320	9.727	11.656	1.071	3.334	0.017	0.028	0.023	0.030	0.015	0.016	0.032	0.011	0.214	0.014	0.157
2021-11-14	0.787	1.943	12.747	13.221	0.000	13.180	13.280	13.075	13.166	13.159	0.744	4.580	0.004	0.016	0.012	0.008	0.005	0.005	0.022	0.002	0.027	0.008	0.006
2021-11-21	6.437	0.657	10.987	11.551	7.030	11.462	11.683	11.478	11.358	11.413	0.581	5.215	0.013	0.024	0.014	0.024	0.011	0.002	0.004	0.002	0.027	0.011	0.014
2021-11-28	2.455	1.033	10.684	11.429	11.343	11.436	11.353	11.168	11.207	11.381	1.342	4.312	0.059	0.138	0.040	0.218	0.027	0.076	0.030	0.012	0.080	0.025	0.151
2021-12-05	1.542	2.042	8.201	12.200	11.938	10.443	11.936	8.452	11.966	11.947	2.031	2.550	0.358	0.247	0.269	0.344	0.314	0.472	0.370	0.481	0.646	0.386	0.865
2021-12-12	0.000	1.381	9.875	11.812	11.708	11.521	11.701	10.744	11.372	11.660	1.492	2.998	0.043	0.060	0.365	0.292	0.036	0.195	0.175	0.652	0.488	0.160	1.269
2021-12-19	0.450	0.366	11.171	12.219	12.109	12.034	12.261	10.322	12.080	12.114	0.351	4.270	0.013	0.010	0.023	0.014	0.013	0.012	0.006	0.128	0.016	0.011	0.007
2021-12-26	0.125	2.291	8.085	9.868	10.128	9.287	9.495	9.809	9.875	12.211	1.511	5.285	2.225	0.497	0.497	0.461	0.252	0.883	0.222	1.893	3.839	1.091	0.174
2022-01-02	0.590	1.876	9.274	12.763	9.630	12.418	12.706	11.480	12.554	12.137	0.674	2.379	0.295	0.135	0.193	0.093	0.058	0.048	0.194	0.092	0.363	0.035	0.012
2022-01-09	1.141	1.605	10.083	13.207	5.282	12.888	13.296	12.368	12.975	13.036	1.060	1.770	0.064	0.520	0.053	0.045	0.204	0.065	0.058	0.000	0.116	0.075	0.087
2022-01-16	2.887	0.472	10.891	12.053	11.950	11.849	12.067	11.485	12.025	11.962	0.408	1.881	0.004	0.005	0.022	0.003	0.010	0.006	0.006	0.000	0.003	0.003	0.009
2022-01-23	4.736	0.371	10.497	11.750	11.502	11.612	11.719	11.458	11.522	11.646	0.435	2.660	0.007	0.014	0.011	0.010	0.012	0.009	0.005	0.000	0.013	0.008	0.003
2022-01-30	0.000	0.230	10.798	11.201	11.949	11.892	11.949	10.625	11.863	11.978	0.202	7.256	0.000	0.029	0.000	0.000	0.029	0.000	0.000	0.000	0.000	0.000	0.000



Weekly data access size in TB

index	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnet01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache10	Xcache11	Total
2021-06-27	0.427	21.320	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.345	9.009	9.187	9.010	8.826	4.697	8.052	8.455	8.354	8.751	8.859	11.800	127.093
2021-07-04	1.142	36.604	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.960	14.738	15.600	14.940	14.868	3.304	14.302	15.553	15.244	12.864	14.496	24.506	210.121
2021-07-11	0.275	32.939	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.902	14.049	14.788	13.717	13.996	10.810	12.885	13.854	13.424	11.073	13.940	20.673	193.325
2021-07-18	0.201	39.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.158	16.009	16.085	15.501	15.654	15.788	15.147	15.824	15.572	15.680	15.466	25.832	232.933
2021-07-25	0.400	24.281	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.270	10.123	10.161	10.201	9.924	9.956	10.003	10.251	10.065	10.046	9.959	17.399	146.039
2021-08-01	0.135	25.446	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.395	9.487	9.908	10.673	10.041	9.709	9.425	10.288	9.842	10.059	9.259	16.251	143.919
2021-08-08	0.394	29.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.274	11.606	11.344	11.657	11.655	11.670	11.049	11.511	11.465	11.768	11.436	17.600	166.714
2021-08-15	0.749	41.385	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.147	4.286	4.270	4.280	4.387	4.179	3.937	4.286	4.158	4.626	4.206	6.571	92.467
2021-08-22	2.790	26.749	0.000	6.610	6.083	6.090	6.240	5.986	0.000	0.000	0.000	0.401	0.000	1.591	1.255	1.469	1.381	1.331	1.378	1.323	1.751	1.375	1.375	75.180
2021-08-29	3.533	32.931	0.000	28.022	29.891	31.807	33.051	17.674	0.000	0.000	0.000	0.479	4.430	6.124	5.542	5.819	5.526	4.899	5.549	5.343	6.378	5.195	7.062	239.257
2021-09-05	0.194	26.023	4.083	7.094	12.509	24.473	26.227	16.984	0.000	0.000	0.000	0.190	2.998	3.525	3.154	3.280	3.118	2.569	3.103	2.904	3.775	3.023	4.084	153.310
2021-09-12	0.161	8.311	7.664	6.873	0.000	7.807	7.959	8.351	0.000	0.000	0.000	0.176	0.583	0.808	0.547	0.611	0.571	0.468	0.569	0.485	0.858	0.554	0.598	53.953
2021-09-19	1.578	4.444	4.117	4.298	2.256	4.239	4.309	4.474	0.000	0.000	0.000	0.171	0.567	0.805	0.533	0.630	0.557	0.510	0.534	0.530	0.810	0.545	0.280	36.187
2021-09-26	0.836	9.035	7.430	9.133	9.287	8.967	9.042	8.546	6.570	6.676	0.000	0.208	0.296	0.426	0.348	0.383	0.259	0.282	0.254	0.305	0.510	0.299	0.350	79.443
2021-10-03	1.217	6.935	6.540	6.689	6.772	6.856	6.790	6.991	6.569	6.353	0.000	0.275	0.021	0.033	0.040	0.027	0.039	0.020	0.016	0.023	0.044	0.039	0.044	62.334
2021-10-10	0.002	12.624	11.066	12.014	11.979	12.099	12.575	12.457	11.516	11.526	0.000	0.224	0.011	0.017	0.014	0.013	0.010	0.015	0.006	0.006	0.013	0.025	0.137	108.351
2021-10-17	0.932	14.504	0.917	13.767	14.050	14.019	14.460	14.262	13.830	13.642	0.000	0.253	0.012	0.013	0.002	0.014	0.012	0.015	0.007	0.014	0.009	0.011	0.107	114.852
2021-10-24	2.408	27.122	0.000	27.772	26.470	27.302	28.002	25.799	27.029	26.941	0.022	0.499	0.039	0.095	0.038	0.045	0.035	0.048	0.036	0.052	0.083	0.048	0.202	220.087
2021-10-31	2.006	18.682	11.433	18.442	17.769	17.944	18.765	17.879	7.926	17.857	0.478	0.538	0.016	0.029	0.006	0.006	0.006	0.003	0.016	0.017	0.035	0.015	0.015	149.883
2021-11-07	0.000	41.404	34.365	41.035	12.111	40.779	41.092	31.434	36.945	39.806	0.590	0.513	0.053	0.045	0.093	0.080	0.047	0.050	0.057	0.042	0.071	0.050	0.095	320.756
2021-11-14	1.726	5.600	18.670	22.093	0.000	21.556	22.475	19.758	21.681	21.415	1.164	0.328	0.012	0.035	0.020	0.023	0.012	0.008	0.012	0.005	0.053	0.012	0.007	156.664
2021-11-21	1.117	0.156	9.017	10.241	5.710	9.861	10.427	9.888	9.780	9.853	0.131	0.214	0.012	0.022	0.006	0.011	0.006	0.002	0.005	0.000	0.023	0.007	0.003	76.491
2021-11-28	0.430	1.368	33.259	38.209	37.487	37.755	38.211	33.243	37.399	38.009	1.876	0.559	0.061	0.076	0.068	0.062	0.061	0.047	0.059	0.018	0.041	0.052	0.047	298.397
2021-12-05	0.251	1.601	48.931	98.150	93.546	80.243	96.866	48.094	95.904	94.858	1.623	1.166	0.097	0.170	0.065	0.088	0.071	0.068	0.071	0.094	0.161	0.084	0.099	662.301
2021-12-12	0.000	0.175	8.502	12.476	11.976	11.641	12.564	9.304	11.918	12.332	0.177	0.131	0.012	0.021	0.018	0.019	0.017	0.008	0.014	0.018	0.028	0.012	0.029	91.392
2021-12-19	0.032	0.422	28.089	34.530	33.950	33.649	35.274	25.585	33.680	34.071	0.470	0.522	0.016	0.006	0.018	0.016	0.014	0.011	0.005	0.008	0.021	0.007	0.006	260.400
2021-12-26	0.000	0.468	11.538	17.532	17.125	15.521	16.739	15.736	16.958	20.503	0.611	1.048	0.195	0.154	0.165	0.148	0.157	0.174	0.146	0.138	0.203	0.149	0.152	135.560
2022-01-02	2.168	1.065	46.996	92.880	67.931	91.166	91.893	76.027	91.768	85.777	0.667	0.981	0.044	0.044	0.052	0.063	0.035	0.037	0.038	0.007	0.040	0.030	0.037	649.746
2022-01-09	2.024	2.666	59.376	108.377	42.585	104.667	109.045	98.806	106.142	106.671	1.159	0.646	0.073	0.083	0.069	0.066	0.069	0.077	0.091	0.000	0.074	0.055	0.103	742.924
2022-01-16	2.018	0.386	80.187	93.485	91.852	90.933	94.872	88.104	92.419	92.229	0.336	2.687	0.007	0.003	0.006	0.005	0.009	0.004	0.007	0.000	0.001	0.007	0.010	729.566
2022-01-23	2.585	0.111	22.746	27.707	26.930	27.158	27.585	27.500	26.925	27.557	0.137	0.390	0.003	0.007	0.000	0.006	0.005	0.006	0.006	0.000	0.011	0.004	0.003	217.381
2022-01-30	0.000	0.002	0.380	0.418	0.439	0.437	0.446	0.385	0.457	0.446	0.001	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.427	



Weekly data access size in TB in proportion

index	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnet01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache10	Xcache11
2021-06-27	0.336	16.775	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.140	7.088	7.229	7.089	6.944	3.696	6.336	6.653	6.573	6.886	6.971	9.284
2021-07-04	0.543	17.421	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.692	7.014	7.424	7.110	7.076	1.572	6.807	7.402	7.255	6.122	6.899	11.663
2021-07-11	0.142	17.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.570	7.267	7.650	7.095	7.240	5.591	6.665	7.166	6.944	5.728	7.211	10.694
2021-07-18	0.086	16.751	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.790	6.873	6.905	6.654	6.720	6.778	6.503	6.793	6.685	6.731	6.640	11.090
2021-07-25	0.274	16.626	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.239	6.932	6.958	6.985	6.795	6.817	6.849	7.019	6.892	6.879	6.819	11.914
2021-08-01	0.094	17.681	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.359	6.592	6.885	7.416	6.977	6.746	6.549	7.148	6.839	6.990	6.433	11.292
2021-08-08	0.236	17.566	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.564	6.962	6.805	6.992	6.991	7.000	6.627	6.904	6.877	7.059	6.860	10.557
2021-08-15	0.810	44.757	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.240	4.635	4.618	4.628	4.744	4.520	4.258	4.636	4.496	5.003	4.548	7.106
2021-08-22	3.711	35.580	0.000	8.793	8.092	8.101	8.300	7.962	0.000	0.000	0.000	0.534	0.000	2.117	1.670	1.955	1.837	1.770	1.833	1.759	2.329	1.829	1.829
2021-08-29	1.477	13.764	0.000	11.712	12.493	13.294	13.814	7.387	0.000	0.000	0.000	0.200	1.852	2.560	2.316	2.432	2.310	2.048	2.319	2.233	2.666	2.171	2.951
2021-09-05	0.127	16.974	2.663	4.627	8.159	15.963	17.107	11.078	0.000	0.000	0.000	0.124	1.956	2.300	2.057	2.140	2.034	1.676	2.024	1.894	2.462	1.972	2.664
2021-09-12	0.298	15.405	14.206	12.738	0.000	14.470	14.751	15.477	0.000	0.000	0.000	0.326	1.080	1.497	1.014	1.133	1.059	0.868	1.055	0.899	1.590	1.026	1.109
2021-09-19	4.360	12.281	11.378	11.876	6.234	11.714	11.908	12.363	0.000	0.000	0.000	0.472	1.566	2.224	1.473	1.741	1.540	1.410	1.475	1.465	2.240	1.507	0.774
2021-09-26	1.053	11.373	9.353	11.497	11.690	11.288	11.382	10.757	8.270	8.403	0.000	0.262	0.373	0.536	0.438	0.482	0.327	0.354	0.319	0.384	0.642	0.376	0.440
2021-10-03	1.952	11.125	10.492	10.731	10.864	10.998	10.893	11.216	10.539	10.193	0.000	0.441	0.034	0.053	0.064	0.044	0.063	0.032	0.026	0.036	0.071	0.062	0.071
2021-10-10	0.002	11.651	10.213	11.088	11.056	11.167	11.606	11.497	10.628	10.637	0.000	0.207	0.010	0.016	0.013	0.012	0.009	0.014	0.006	0.005	0.012	0.024	0.127
2021-10-17	0.811	12.629	0.798	11.987	12.233	12.206	12.591	12.417	12.042	11.878	0.000	0.220	0.010	0.011	0.002	0.012	0.010	0.013	0.006	0.012	0.008	0.010	0.093
2021-10-24	1.094	12.323	0.000	12.619	12.027	12.405	12.723	11.722	12.281	12.241	0.010	0.227	0.018	0.043	0.017	0.020	0.016	0.022	0.016	0.024	0.038	0.022	0.092
2021-10-31	1.339	12.465	7.628	12.304	11.855	11.972	12.519	11.929	5.288	11.914	0.319	0.359	0.011	0.019	0.004	0.004	0.002	0.010	0.012	0.024	0.010	0.010	
2021-11-07	0.000	12.908	10.714	12.793	3.776	12.713	12.811	9.800	11.518	12.410	0.184	0.160	0.017	0.014	0.029	0.025	0.015	0.015	0.018	0.013	0.022	0.016	0.030
2021-11-14	1.101	3.575	11.917	14.102	0.000	13.760	14.346	12.611	13.839	13.669	0.743	0.209	0.007	0.022	0.012	0.015	0.007	0.005	0.008	0.003	0.034	0.007	0.004
2021-11-21	1.460	0.203	11.789	13.389	7.464	12.892	13.632	12.928	12.786	12.881	0.171	0.279	0.016	0.028	0.008	0.014	0.007	0.002	0.006	0.000	0.030	0.009	0.004
2021-11-28	0.144	0.458	11.146	12.805	12.563	12.653	12.805	11.141	12.533	12.738	0.629	0.187	0.020	0.025	0.023	0.021	0.021	0.016	0.020	0.006	0.014	0.018	0.016
2021-12-05	0.038	0.242	7.388	14.820	14.124	12.116	14.626	7.262	14.480	14.322	0.245	0.176	0.015	0.026	0.010	0.013	0.011	0.010	0.011	0.014	0.024	0.013	0.015
2021-12-12	0.000	0.191	9.302	13.652	13.104	12.737	13.748	10.181	13.041	13.493	0.194	0.143	0.013	0.023	0.020	0.021	0.018	0.009	0.015	0.020	0.031	0.013	0.031
2021-12-19	0.012	0.162	10.787	13.260	13.038	12.922	13.546	9.825	12.934	13.084	0.180	0.200	0.006	0.002	0.007	0.006	0.006	0.004	0.002	0.003	0.008	0.003	0.002
2021-12-26	0.000	0.345	8.511	12.933	12.633	11.449	12.348	11.608	12.510	15.124	0.451	0.773	0.144	0.113	0.122	0.109	0.116	0.129	0.108	0.101	0.150	0.110	0.112
2022-01-02	0.334	0.164	7.233	14.295	10.455	14.031	14.143	11.701	14.124	13.202	0.103	0.151	0.007	0.007	0.008	0.010	0.005	0.006	0.006	0.001	0.006	0.005	0.006
2022-01-09	0.272	0.359	7.992	14.588	5.732	14.088	14.678	13.300	14.287	14.358	0.156	0.087	0.010	0.011	0.009	0.009	0.010	0.012	0.000	0.010	0.007	0.014	
2022-01-16	0.277	0.053	10.991	12.814	12.590	12.464	13.004	12.076	12.668	12.642	0.046	0.368	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001
2022-01-23	1.189	0.051	10.463	12.746	12.388	12.493	12.690	12.651	12.386	12.677	0.063	0.179	0.001	0.003	0.000	0.003	0.002	0.003	0.000	0.005	0.002	0.001	
2022-01-30	0.000	0.067	11.081	12.206	12.822	12.742	13.025	11.220	13.332	13.024	0.025	0.455	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Weekly number of cache hits

	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnet01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache10	Xcache11	Total
index																								
2021-06-27	3746	16388	0	0	0	0	0	0	0	0	0	8298	8054	7469	8067	7652	1990	7522	7578	7678	7607	7375	14889	114313
2021-07-04	18749	33508	0	0	0	0	0	0	0	0	0	13968	17305	16593	17180	16757	1310	16808	16516	16434	14059	16149	24336	239672
2021-07-11	5948	33937	0	0	0	0	0	0	0	0	0	12659	11718	13078	10979	11450	7281	11062	11474	11822	8368	11226	14158	175160
2021-07-18	5626	20353	0	0	0	0	0	0	0	0	0	7513	7978	8529	8373	7872	7380	7621	8221	7962	8305	8273	15300	129306
2021-07-25	13177	19914	0	0	0	0	0	0	0	0	0	6275	6077	5971	6037	5877	5970	5720	6021	5964	5984	5920	10381	109288
2021-08-01	4346	30386	0	0	0	0	0	0	0	0	0	11703	4201	4469	4329	4315	4342	4254	4514	4363	4154	3908	7625	96909
2021-08-08	12844	44603	0	0	0	0	0	0	0	0	0	16355	11218	11136	12038	11305	11438	10657	11046	11333	11375	10924	18806	205078
2021-08-15	14166	43907	0	0	0	0	0	0	0	0	0	12084	5124	4872	4900	4795	4940	4601	4432	4612	4662	4786	7688	125569
2021-08-22	50385	32322	0	11625	11627	11601	11611	11890	0	0	0	9770	0	784	665	750	792	652	686	673	871	702	836	158242
2021-08-29	44174	36129	0	32165	36312	35766	35982	44619	0	0	0	9545	4416	6576	6248	6575	6393	5558	6072	5992	6458	5984	7148	342112
2021-09-05	8254	29792	13226	16346	10315	29478	29868	33427	0	0	0	8083	2367	2759	2383	2567	2397	1912	2410	2192	2876	2295	2943	205890
2021-09-12	6608	22770	22798	21973	0	22765	22785	22963	0	0	0	9875	213	329	198	202	199	169	198	181	345	212	229	155012
2021-09-19	20794	22364	22200	22229	13312	22283	22378	22291	0	0	0	10024	292	392	301	360	300	266	299	286	433	322	137	181263
2021-09-26	12468	21551	21081	21508	21654	21616	21640	21584	9763	9806	0	9715	126	177	149	175	137	124	110	123	377	128	154	194166
2021-10-03	18648	20651	20656	20600	20700	20668	20700	20679	20622	20626	0	9984	13	10	12	7	13	3	3	10	13	14	7	214639
2021-10-10	33	21164	21160	21167	21138	21127	21108	21191	21017	20957	0	9595	13	7	3	20	2	7	2	1	65	4	74	199855
2021-10-17	3474	21493	1503	21464	21504	21400	21429	21464	21424	21444	0	9861	0	3	1	2	3	5	1	2	38	3	26	186544
2021-10-24	1544	23652	0	23719	23503	23710	23746	23676	23622	23701	13	9969	10	20	10	18	15	10	9	9	141	6	49	201152
2021-10-31	6853	20834	13965	20767	20619	20786	20798	20664	10191	20856	290	10011	3	15	43	3	2	3	31	32	135	5	127	187033
2021-11-07	1	22331	23346	22308	9358	22379	22213	22995	17929	22655	2602	9780	15	36	15	37	8	8	57	5	589	8	405	199080
2021-11-14	1721	2293	22106	22041	0	22048	22017	22332	21981	22123	1091	9933	1	17	13	3	3	2	41	1	35	5	8	169815
2021-11-21	5316	396	6499	6520	4105	6541	6514	6522	6488	6501	320	4340	1	6	1	13	1	1	0	8	2	5	60101	
2021-11-28	5107	1459	13886	13732	13771	13823	13503	14353	13561	13619	1975	9730	87	257	31	447	20	136	31	6	144	20	296	129994
2021-12-05	2188	6952	18332	20770	21165	19056	20281	18158	20557	20975	6907	10221	1388	856	1019	1334	1217	1865	1460	1905	2538	1525	3460	204129
2021-12-12	0	822	4451	4653	4732	4698	4582	4768	4514	4585	918	2215	7	8	242	191	9	122	106	469	336	101	927	43456
2021-12-19	198	313	14147	14166	14129	14166	14072	12930	14136	14043	275	8805	4	1	4	4	3	12	2	248	7	4	3	121672
2021-12-26	168	2810	7232	7717	8177	7577	7548	8097	7830	9904	1618	6727	2875	562	551	520	222	1072	199	2462	5054	1375	117	90414
2022-01-02	2278	6262	19380	18513	15454	17857	18649	18638	18074	18792	2077	8864	1089	467	622	308	189	150	708	347	1357	102	8	170185
2022-01-09	2394	3760	13431	11086	4054	11067	11104	11311	11085	11157	2791	5658	155	1679	106	101	618	151	142	0	325	210	214	102599
2022-01-16	8741	924	7148	6931	6970	6985	6852	6885	7010	7049	906	5007	1	3	4	2	2	6	0	2	2	4	71436	
2022-01-23	5434	208	4191	4175	4189	4157	4170	3923	4156	4128	261	2919	1	5	1	2	2	4	1	0	7	1	1	41936
2022-01-30	0	3	236	239	250	254	256	229	250	258	2	248	0	0	0	0	0	0	0	0	0	0	0	2225

Weekly number of cache hits in proportion

index	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnets01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache10	Xcache11
2021-06-27	3.277	14.336	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.259	7.046	6.534	7.057	6.694	1.741	6.580	6.629	6.717	6.655	6.452	13.025
2021-07-04	7.823	13.981	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.828	7.220	6.923	7.168	6.992	0.547	7.013	6.891	6.857	5.866	6.738	10.154
2021-07-11	3.396	19.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.227	6.690	7.466	6.268	6.537	4.157	6.315	6.551	6.749	4.777	6.409	8.083
2021-07-18	4.351	15.740	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.810	6.170	6.596	6.475	6.088	5.707	5.894	6.358	6.157	6.423	6.398	11.832
2021-07-25	12.057	18.222	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.742	5.561	5.464	5.524	5.378	5.463	5.234	5.509	5.457	5.475	5.417	9.499
2021-08-01	4.485	31.355	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	12.076	4.335	4.612	4.467	4.453	4.480	4.390	4.658	4.502	4.286	4.033	7.868
2021-08-08	6.263	21.749	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.975	5.470	5.430	5.870	5.513	5.577	5.197	5.386	5.526	5.547	5.327	9.170
2021-08-15	11.281	34.966	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.623	4.081	3.880	3.902	3.819	3.934	3.664	3.530	3.673	3.713	3.811	6.123
2021-08-22	31.840	20.426	0.000	7.346	7.348	7.331	7.337	7.514	0.000	0.000	0.000	6.174	0.000	0.495	0.420	0.474	0.500	0.412	0.434	0.425	0.550	0.444	0.528
2021-08-29	12.912	10.561	0.000	9.402	10.614	10.454	10.518	13.042	0.000	0.000	0.000	2.790	1.291	1.922	1.826	1.922	1.869	1.625	1.775	1.751	1.888	1.749	2.089
2021-09-05	4.009	14.470	6.424	7.939	5.010	14.317	14.507	16.235	0.000	0.000	0.000	3.926	1.150	1.340	1.157	1.247	1.164	0.929	1.171	1.065	1.397	1.115	1.429
2021-09-12	4.263	14.689	14.707	14.175	0.000	14.686	14.699	14.814	0.000	0.000	0.000	6.370	0.137	0.212	0.128	0.130	0.128	0.109	0.128	0.117	0.223	0.137	0.148
2021-09-19	11.472	12.338	12.247	12.263	7.344	12.293	12.346	12.298	0.000	0.000	0.000	5.530	0.161	0.216	0.166	0.199	0.166	0.147	0.165	0.158	0.239	0.178	0.076
2021-09-26	6.421	11.099	10.857	11.077	11.152	11.133	11.145	11.116	5.028	5.050	0.000	5.003	0.065	0.091	0.077	0.090	0.071	0.064	0.057	0.063	0.194	0.066	0.079
2021-10-03	8.688	9.621	9.624	9.598	9.644	9.629	9.644	9.634	9.608	9.610	0.000	4.652	0.006	0.005	0.006	0.003	0.006	0.001	0.001	0.005	0.006	0.007	0.003
2021-10-10	0.017	10.590	10.588	10.591	10.577	10.571	10.562	10.603	10.516	10.486	0.000	4.801	0.007	0.004	0.002	0.010	0.001	0.004	0.001	0.001	0.033	0.002	0.037
2021-10-17	1.862	11.522	0.806	11.506	11.528	11.472	11.487	11.506	11.485	11.495	0.000	5.286	0.000	0.002	0.001	0.001	0.002	0.003	0.001	0.001	0.020	0.002	0.014
2021-10-24	0.768	11.758	0.000	11.792	11.684	11.787	11.805	11.770	11.743	11.783	0.006	4.956	0.005	0.010	0.005	0.009	0.007	0.005	0.004	0.004	0.070	0.003	0.024
2021-10-31	3.664	11.139	7.467	11.103	11.024	11.114	11.120	11.048	5.449	11.151	0.155	5.353	0.002	0.008	0.023	0.002	0.001	0.002	0.017	0.017	0.072	0.003	0.068
2021-11-07	0.001	11.217	11.727	11.206	4.701	11.241	11.158	11.551	9.006	11.380	1.307	4.913	0.008	0.018	0.008	0.019	0.004	0.004	0.029	0.003	0.296	0.004	0.203
2021-11-14	1.013	1.350	13.018	12.979	0.000	12.984	12.965	13.151	12.944	13.028	0.642	5.849	0.001	0.010	0.008	0.002	0.002	0.001	0.024	0.001	0.021	0.003	0.005
2021-11-21	8.845	0.659	10.813	10.848	6.830	10.883	10.838	10.852	10.795	10.817	0.532	7.221	0.002	0.010	0.002	0.022	0.002	0.002	0.002	0.000	0.013	0.003	0.008
2021-11-28	3.929	1.122	10.682	10.564	10.594	10.634	10.387	11.041	10.432	10.477	1.519	7.485	0.067	0.198	0.024	0.344	0.015	0.105	0.024	0.005	0.111	0.015	0.228
2021-12-05	1.072	3.406	8.981	10.175	10.368	9.335	9.935	8.895	10.071	10.275	3.384	5.007	0.680	0.419	0.499	0.654	0.596	0.914	0.715	0.933	1.243	0.747	1.695
2021-12-12	0.000	1.892	10.243	10.707	10.889	10.811	10.544	10.972	10.388	10.551	2.112	5.097	0.016	0.018	0.557	0.440	0.021	0.281	0.244	1.079	0.773	0.232	2.133
2021-12-19	0.163	0.257	11.627	11.643	11.612	11.643	11.566	10.627	11.618	11.542	0.226	7.237	0.003	0.001	0.003	0.003	0.002	0.010	0.002	0.204	0.006	0.003	0.002
2021-12-26	0.186	3.108	7.999	8.535	9.044	8.380	8.348	8.955	8.660	10.954	1.790	7.440	3.180	0.622	0.609	0.575	0.246	1.186	0.220	2.723	5.590	1.521	0.129
2022-01-02	1.339	3.680	11.388	10.878	9.081	10.493	10.958	10.952	10.620	11.042	1.220	5.208	0.640	0.274	0.365	0.181	0.111	0.088	0.416	0.204	0.797	0.060	0.005
2022-01-09	2.333	3.665	13.091	10.805	3.951	10.787	10.823	11.024	10.804	10.874	2.720	5.515	0.151	1.636	0.103	0.098	0.602	0.147	0.138	0.000	0.317	0.205	0.209
2022-01-16	12.236	1.293	10.006	9.702	9.757	9.778	9.592	9.638	9.813	9.868	1.268	7.009	0.001	0.004	0.006	0.003	0.003	0.008	0.000	0.003	0.003	0.006	
2022-01-23	12.958	0.496	9.994	9.956	9.989	9.913	9.944	9.355	9.910	9.844	0.622	6.961	0.002	0.012	0.002	0.005	0.005	0.010	0.002	0.000	0.017	0.002	0.002
2022-01-30	0.000	0.135	10.607	10.742	11.236	11.416	11.506	10.292	11.236	11.596	0.090	11.146	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000



Weekly number of cache misses

index	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnet01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache10	Xcache11	Total
2021-06-27	8842	12980	0	0	0	0	0	0	0	0	0	6980	6091	6518	6106	6003	3256	5643	5861	5759	6043	6343	8226	94651
2021-07-04	31037	14703	0	0	0	0	0	0	0	0	0	5377	6083	6813	6112	6524	1591	5882	6292	6310	5278	6496	11276	119774
2021-07-11	496	9095	0	0	0	0	0	0	0	0	0	2236	3885	3952	3834	3833	2840	3453	3743	3726	2970	3923	6111	54097
2021-07-18	1574	13152	0	0	0	0	0	0	0	0	0	3487	5637	5737	5470	5743	6114	5569	5834	5786	5623	5576	9862	85164
2021-07-25	16439	9956	0	0	0	0	0	0	0	0	0	1871	3657	3621	3715	3581	3546	3628	3636	3439	3624	3613	6475	70801
2021-08-01	1926	8011	0	0	0	0	0	0	0	0	0	1370	3439	3387	3516	3341	3457	3293	3416	3226	3493	3334	5424	50633
2021-08-08	11540	18320	0	0	0	0	0	0	0	0	0	5528	9199	9043	8756	8956	8831	8680	8337	8679	9087	8875	14061	137892
2021-08-15	28582	18354	0	0	0	0	0	0	0	0	0	2497	4286	4109	3860	4084	3943	3850	3534	3926	3985	3891	6658	95559
2021-08-22	47073	10257	0	1802	1800	1843	1891	1498	0	0	0	91	0	565	392	484	455	465	473	414	577	453	458	70991
2021-08-29	2309	19309	0	15917	16584	18674	19674	8275	0	0	0	155	2330	3115	2787	3003	2816	2553	2814	2771	3441	2704	4470	133701
2021-09-05	4222	10334	697	1398	6034	9291	10250	5176	0	0	0	37	1273	1590	1324	1475	1335	1089	1335	1280	1699	1203	1513	62555
2021-09-12	5029	2157	2020	1960	0	2129	2112	2074	0	0	0	11	156	188	158	192	176	170	176	148	209	177	159	19401
2021-09-19	974	989	995	1013	526	992	994	985	0	0	0	12	123	180	124	141	138	124	124	110	144	113	86	8887
2021-09-26	1083	3060	2546	3060	3105	2961	3021	2798	1929	1956	0	13	70	88	85	78	76	67	80	88	89	69	114	26436
2021-10-03	2781	2254	2085	2216	2193	2220	2218	2326	2156	2121	0	54	12	16	31	12	18	12	8	14	21	26	28	22822
2021-10-10	0	4356	3556	4077	4032	4014	4332	4161	3898	3865	0	41	11	16	11	16	14	11	8	6	17	18	108	36568
2021-10-17	62	4526	335	4327	4330	4391	4481	4486	4284	4273	0	47	10	10	5	11	9	7	7	8	9	78	35707	
2021-10-24	14	7444	0	7484	7236	7363	7553	7331	7379	7344	20	123	29	61	31	27	29	26	27	37	49	35	130	59772
2021-10-31	719	6438	3889	6388	6042	6182	6372	6209	2720	6065	345	172	26	26	14	13	13	5	15	20	27	23	16	51739
2021-11-07	0	12484	10069	12328	3818	12255	12400	10656	10985	11994	582	132	37	48	53	52	36	40	39	27	48	33	63	98179
2021-11-14	0	1953	5751	6853	0	6755	7005	6243	6793	6635	535	77	8	18	14	15	9	10	6	3	24	13	6	48726
2021-11-21	110	158	2762	3216	1821	3120	3334	3153	3086	3119	170	56	10	14	11	7	8	1	2	2	15	7	7	24189
2021-11-28	540	918	10689	12558	12321	12482	12611	11337	12218	12561	1113	188	49	60	61	55	43	39	38	21	40	37	51	100030
2021-12-05	4216	1525	15721	29887	28405	24303	29277	16936	29126	28629	1526	367	100	169	98	95	87	95	75	91	146	79	133	211086
2021-12-12	0	214	2956	4207	4050	3944	4195	3291	4016	4161	201	34	25	37	32	28	18	24	25	20	30	19	25	31552
2021-12-19	747	454	9287	11466	11273	11078	11649	8724	11206	11370	462	152	23	19	45	26	24	14	10	20	27	20	12	88108
2021-12-26	0	275	3656	5572	5463	4930	5239	5113	5469	6541	417	390	121	107	118	101	117	117	100	87	116	94	117	44260
2022-01-02	0	978	16417	30752	21717	30077	30396	25677	30387	28058	526	319	49	54	123	52	33	37	40	10	45	35	40	215822
2022-01-09	1399	1575	20083	32811	13504	31770	33091	29799	32040	32172	733	226	58	50	70	50	59	64	52	0	61	40	75	229782
2022-01-16	450	580	27523	31438	31073	30735	31562	29675	31271	31030	393	980	13	12	66	6	29	17	12	0	9	6	24	246904
2022-01-23	4	218	7863	9318	9019	9177	9287	9235	9075	9245	239	135	7	11	12	10	12	6	5	0	8	8	3	72897
2022-01-30	0	5	139	150	165	159	159	140	162	158	5	4	0	1	0	0	0	1	0	0	0	0	0	1248

Weekly number of cache misses in proportion

index	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnets01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache10	Xcache11
2021-06-27	9.342	13.714	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.374	6.435	6.886	6.451	6.342	3.440	5.962	6.192	6.084	6.385	6.701	8.691
2021-07-04	25.913	12.276	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.489	5.079	5.688	5.103	5.447	1.328	4.911	5.253	5.268	4.407	5.424	9.414
2021-07-11	0.917	16.812	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.133	7.182	7.305	7.087	7.085	5.250	6.383	6.919	6.888	5.490	7.252	11.296
2021-07-18	1.848	15.443	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.094	6.619	6.736	6.423	6.743	7.179	6.539	6.850	6.794	6.603	6.547	11.580
2021-07-25	23.219	14.062	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.643	5.165	5.114	5.247	5.058	5.008	5.124	5.136	4.857	5.119	5.103	9.145
2021-08-01	3.804	15.822	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.706	6.792	6.689	6.944	6.598	6.828	6.504	6.747	6.371	6.899	6.585	10.712
2021-08-08	8.369	13.286	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.009	6.671	6.558	6.350	6.495	6.404	6.295	6.046	6.294	6.590	6.436	10.197
2021-08-15	29.910	19.207	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.613	4.485	4.300	4.039	4.274	4.126	4.029	3.698	4.108	4.170	4.072	6.967
2021-08-22	66.308	14.448	0.000	2.538	2.536	2.596	2.664	2.110	0.000	0.000	0.000	0.128	0.000	0.796	0.552	0.682	0.641	0.655	0.666	0.583	0.813	0.638	0.645
2021-08-29	1.727	14.442	0.000	11.905	12.404	13.967	14.715	6.189	0.000	0.000	0.000	0.116	1.743	2.330	2.085	2.246	2.106	1.909	2.105	2.073	2.574	2.022	3.343
2021-09-05	6.749	16.520	1.114	2.235	9.646	14.853	16.386	8.274	0.000	0.000	0.000	0.059	2.035	2.542	2.117	2.358	2.134	1.741	2.134	2.046	2.716	1.923	2.419
2021-09-12	25.921	11.118	10.412	10.103	0.000	10.974	10.886	10.690	0.000	0.000	0.000	0.057	0.804	0.969	0.814	0.990	0.907	0.876	0.907	0.763	1.077	0.912	0.820
2021-09-19	10.960	11.129	11.196	11.399	5.919	11.162	11.185	11.084	0.000	0.000	0.000	0.135	1.384	2.025	1.395	1.587	1.553	1.395	1.395	1.238	1.620	1.272	0.968
2021-09-26	4.097	11.575	9.631	11.575	11.745	11.201	11.428	10.584	7.297	7.399	0.000	0.049	0.265	0.333	0.322	0.295	0.287	0.253	0.303	0.333	0.337	0.261	0.431
2021-10-03	12.186	9.876	9.136	9.710	9.609	9.727	9.719	10.192	9.447	9.294	0.000	0.237	0.053	0.070	0.136	0.053	0.079	0.053	0.035	0.061	0.092	0.114	0.123
2021-10-10	0.000	11.912	9.724	11.149	11.026	10.977	11.846	11.379	10.660	10.569	0.000	0.112	0.030	0.044	0.030	0.044	0.038	0.030	0.022	0.016	0.046	0.049	0.295
2021-10-17	0.174	12.675	0.938	12.118	12.126	12.297	12.549	12.563	11.998	11.967	0.000	0.132	0.028	0.028	0.014	0.031	0.031	0.025	0.020	0.020	0.022	0.025	0.218
2021-10-24	0.023	12.454	0.000	12.521	12.106	12.318	12.636	12.265	12.345	12.287	0.033	0.206	0.049	0.102	0.052	0.045	0.049	0.043	0.045	0.062	0.082	0.059	0.217
2021-10-31	1.390	12.443	7.517	12.347	11.678	11.948	12.316	12.001	5.257	11.722	0.667	0.332	0.050	0.050	0.027	0.025	0.025	0.010	0.029	0.039	0.052	0.044	0.031
2021-11-07	0.000	12.716	10.256	12.557	3.889	12.482	12.630	10.854	11.189	12.216	0.593	0.134	0.038	0.049	0.054	0.053	0.037	0.041	0.040	0.028	0.049	0.034	0.064
2021-11-14	0.000	4.008	11.803	14.064	0.000	13.863	14.376	12.812	13.941	13.617	1.098	0.158	0.016	0.037	0.029	0.031	0.018	0.021	0.012	0.006	0.049	0.027	0.012
2021-11-21	0.455	0.653	11.418	13.295	7.528	12.898	13.783	13.035	12.758	12.894	0.703	0.232	0.041	0.058	0.045	0.029	0.033	0.004	0.008	0.062	0.029	0.029	
2021-11-28	0.540	0.918	10.686	12.554	12.317	12.478	12.607	11.334	12.214	12.557	1.113	0.188	0.049	0.060	0.061	0.055	0.043	0.039	0.038	0.021	0.040	0.037	0.051
2021-12-05	1.997	0.722	7.448	14.159	13.457	11.513	13.870	8.023	13.798	13.563	0.723	0.174	0.047	0.080	0.046	0.045	0.041	0.045	0.036	0.043	0.069	0.037	0.063
2021-12-12	0.000	0.678	9.369	13.334	12.836	12.500	13.296	10.430	12.728	13.188	0.637	0.108	0.079	0.117	0.101	0.089	0.057	0.076	0.079	0.063	0.095	0.060	0.079
2021-12-19	0.848	0.515	10.540	13.014	12.795	12.573	13.221	9.901	12.718	12.905	0.524	0.173	0.026	0.022	0.051	0.030	0.027	0.016	0.011	0.023	0.031	0.023	0.014
2021-12-26	0.000	0.621	8.260	12.589	12.343	11.139	11.837	11.552	12.357	14.779	0.942	0.881	0.273	0.242	0.267	0.228	0.264	0.264	0.226	0.197	0.262	0.212	0.264
2022-01-02	0.000	0.453	7.607	14.249	10.062	13.936	14.084	11.897	14.080	13.001	0.244	0.148	0.023	0.025	0.057	0.024	0.015	0.017	0.019	0.005	0.021	0.016	0.019
2022-01-09	0.609	0.685	8.740	14.279	5.877	13.826	14.401	12.968	13.944	14.001	0.319	0.098	0.025	0.022	0.030	0.022	0.026	0.028	0.023	0.000	0.027	0.017	0.033
2022-01-16	0.182	0.235	11.147	12.733	12.585	12.448	12.783	12.019	12.665	12.568	0.159	0.397	0.005	0.005	0.027	0.002	0.012	0.007	0.005	0.000	0.004	0.002	0.010
2022-01-23	0.005	0.299	10.786	12.782	12.372	12.589	12.740	12.669	12.449	12.682	0.328	0.185	0.010	0.015	0.016	0.014	0.016	0.008	0.007	0.000	0.011	0.011	0.004
2022-01-30	0.000	0.401	11.138	12.019	13.221	12.740	12.740	11.218	12.981	12.660	0.401	0.321	0.000	0.080	0.000	0.000	0.080	0.000	0.000	0.000	0.000	0.000	0.000



Weekly proportion of number of cache hit rates

index	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnets01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache10	Xcache11
2021-06-27	29.759	55.802	nan	54.313	56.939	53.400	56.918	56.038	37.934	57.136	56.388	57.141	55.729	53.761	64.413								
2021-07-04	37.659	69.503	nan	72.205	73.991	70.892	73.759	71.977	45.157	74.077	72.413	72.256	72.705	71.314	68.337								
2021-07-11	92.303	78.865	nan	84.988	75.101	76.794	74.117	74.920	71.940	76.211	75.403	76.036	73.805	74.104	69.851								
2021-07-18	78.139	60.746	nan	68.300	58.597	59.786	60.485	57.819	54.691	57.779	58.492	57.914	59.628	59.737	60.806								
2021-07-25	44.493	66.669	nan	77.032	62.431	62.250	61.905	62.138	62.736	61.190	62.349	63.427	62.281	62.100	61.586								
2021-08-01	69.292	79.136	nan	89.520	54.987	56.886	55.182	56.361	55.674	56.367	56.923	57.491	54.322	53.963	58.434								
2021-08-08	52.674	70.885	nan	74.738	54.944	55.186	57.892	55.797	56.431	55.112	56.988	56.631	55.591	55.175	57.218								
2021-08-15	33.138	70.521	nan	82.875	54.453	54.248	55.936	54.004	55.612	54.443	55.636	54.017	53.915	55.157	53.590								
2021-08-22	51.699	75.911	nan	86.579	86.594	86.291	85.995	88.811	nan	nan	99.077	nan	58.117	62.914	60.778	63.512	58.371	59.189	61.914	60.152	60.779	64.606	
2021-08-29	95.033	65.170	nan	66.896	68.648	65.698	64.651	84.356	nan	nan	98.402	65.461	67.857	69.153	68.647	69.421	68.524	68.332	68.378	65.239	68.877	61.525	
2021-09-05	66.159	74.246	94.994	92.121	63.093	76.035	74.450	86.592	nan	nan	99.544	65.027	63.440	64.284	63.508	64.228	63.712	64.352	63.134	62.863	65.609	66.046	
2021-09-12	56.784	91.347	91.861	91.810	nan	91.448	91.517	91.716	nan	nan	99.889	57.724	63.636	55.618	51.269	53.067	49.853	52.941	55.015	62.274	54.499	59.021	
2021-09-19	95.526	95.765	95.710	95.642	96.199	95.738	95.747	95.768	nan	nan	99.880	70.361	68.531	70.824	71.856	68.493	68.205	70.686	72.222	75.043	74.023	61.435	
2021-09-26	92.008	87.567	89.224	87.545	87.459	87.952	87.750	88.524	83.502	83.370	nan	99.866	64.286	66.792	63.675	69.170	64.319	64.921	57.895	58.294	80.901	64.975	57.463
2021-10-03	87.022	90.159	90.832	90.288	90.421	90.301	90.322	89.889	90.535	90.676	nan	99.462	52.000	38.462	27.907	36.842	41.935	20.000	27.273	41.667	38.235	35.000	20.000
2021-10-10	100.000	82.931	85.613	83.850	83.981	84.034	82.972	83.587	84.355	84.429	nan	99.575	54.167	30.435	21.429	55.556	12.500	38.889	20.000	14.286	79.268	18.182	40.659
2021-10-17	98.247	82.605	81.774	83.223	83.239	82.975	82.706	82.713	83.336	83.385	nan	99.526	0.000	23.077	16.667	15.385	21.429	35.714	12.500	22.222	82.609	25.000	25.000
2021-10-24	99.101	76.061	nan	76.015	76.460	76.304	75.868	76.357	76.198	76.344	39.394	98.781	25.641	24.691	24.390	40.000	34.091	27.778	25.000	19.565	74.211	14.634	27.374
2021-10-31	90.504	76.393	78.218	76.476	77.338	77.077	76.548	76.895	78.933	77.471	45.669	98.311	10.345	36.585	75.439	18.750	13.333	37.500	67.391	61.538	83.333	17.857	88.811
2021-11-07	100.000	64.142	69.867	64.407	71.023	64.616	64.175	68.334	62.008	65.384	81.721	98.668	28.846	42.857	22.059	41.573	18.182	16.667	59.375	15.625	92.465	19.512	86.538
2021-11-14	100.000	54.004	79.355	76.282	nan	76.548	75.863	78.152	76.392	76.928	67.097	99.231	11.111	48.571	48.148	16.667	25.000	16.667	87.234	25.000	59.322	27.778	57.143
2021-11-21	97.973	71.480	70.176	66.968	69.271	67.705	66.145	67.411	67.767	67.578	65.306	98.726	9.091	30.000	8.333	65.000	11.111	50.000	33.333	0.000	34.783	22.222	41.667
2021-11-28	90.437	61.380	56.505	52.233	52.779	52.549	51.708	55.870	52.605	52.021	63.957	98.104	63.971	81.073	33.696	89.044	31.746	77.714	44.928	22.222	78.261	35.088	85.303
2021-12-05	34.166	82.010	53.834	41.001	42.697	43.949	40.924	51.741	41.376	42.285	81.904	96.534	93.280	83.512	91.226	93.352	93.328	95.153	95.114	95.441	94.560	95.075	96.298
2021-12-12	nan	79.344	60.092	52.517	53.883	54.362	52.205	59.164	52.919	52.424	82.038	98.488	21.875	17.778	88.321	87.215	33.333	83.562	80.916	95.910	91.803	84.167	97.374
2021-12-19	20.952	40.808	60.370	55.267	55.622	56.116	54.710	59.712	55.781	55.259	37.313	98.303	14.815	5.000	8.163	13.333	11.111	46.154	16.667	92.537	20.588	16.667	20.000
2021-12-26	100.000	91.086	66.422	58.071	59.949	60.582	59.029	61.294	58.877	60.225	79.509	94.520	95.961	84.006	82.362	83.736	65.487	90.160	66.555	96.587	97.756	93.601	50.000
2022-01-02	100.000	86.492	54.139	37.578	41.575	37.253	38.024	42.058	37.296	40.111	79.793	96.526	95.694	89.635	83.490	85.556	85.135	80.214	94.652	97.199	96.790	74.453	16.667
2022-01-09	63.116	70.478	40.076	25.255	23.089	25.835	25.125	27.514	25.704	25.749	79.200	96.159	72.770	97.108	60.227	66.887	91.285	70.233	73.196	nan	84.197	84.000	74.048
2022-01-16	95.104	61.436	20.617	18.064	18.321	18.518	17.837	18.312	18.512	18.512	69.746	83.631	7.143	20.000	5.714	25.000	6.452	10.526	33.333	nan	18.182	25.000	14.286
2022-01-23	99.926	48.826	34.769	30.942	31.716	31.176	30.988	29.815	31.411	30.868	52.200	95.580	12.500	31.250	7.692	16.667	14.286	40.000	16.667	nan	46.667	11.111	25.000
2022-01-30	nan	37.500	62.933	61.440	60.241	61.501	61.687	62.060	60.680	62.019	28.571	98.413	nan	0.000	nan	nan	0.000	nan	nan	nan	nan	nan	nan



Weekly network demand reduction rate (traffic frequency)

index	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnet01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache10	Xcache11
2021-06-27	1.424	2.263	nan	2.189	2.322	2.146	2.321	2.275	1.611	2.333	2.293	2.333	2.259	2.163	2.810								
2021-07-04	1.604	3.279	nan	3.598	3.845	3.435	3.811	3.569	1.823	3.858	3.625	3.604	3.664	3.486	3.158								
2021-07-11	12.992	4.731	nan	6.661	4.016	4.309	3.864	3.987	3.564	4.204	4.065	4.173	3.818	3.862	3.317								
2021-07-18	4.574	2.548	nan	3.155	2.415	2.487	2.531	2.371	2.207	2.368	2.409	2.376	2.477	2.484	2.551								
2021-07-25	1.802	3.000	nan	4.354	2.662	2.649	2.625	2.641	2.684	2.577	2.656	2.734	2.651	2.639	2.603								
2021-08-01	3.256	4.793	nan	9.542	2.222	2.319	2.231	2.292	2.256	2.292	2.321	2.352	2.189	2.172	2.406								
2021-08-08	2.113	3.435	nan	3.959	2.219	2.231	2.375	2.262	2.295	2.228	2.325	2.306	2.252	2.231	2.337								
2021-08-15	1.496	3.392	nan	5.839	2.196	2.186	2.269	2.174	2.253	2.195	2.254	2.175	2.170	2.230	2.155								
2021-08-22	2.070	4.151	nan	7.451	7.459	7.295	7.140	8.937	nan	nan	108.363	nan	2.388	2.696	2.550	2.741	2.402	2.450	2.626	2.510	2.550	2.825	
2021-08-29	20.131	2.871	nan	3.021	3.190	2.915	2.829	6.392	nan	nan	62.581	2.895	3.111	3.242	3.189	3.270	3.177	3.158	3.162	2.877	3.213	2.599	
2021-09-05	2.955	3.883	19.976	12.692	2.709	4.173	3.914	7.458	nan	nan	219.459	2.859	2.735	2.800	2.740	2.796	2.756	2.805	2.712	2.693	2.908	2.945	
2021-09-12	2.314	11.556	12.286	12.211	nan	11.693	11.788	12.072	nan	nan	898.727	2.365	2.750	2.253	2.052	2.131	1.994	2.125	2.223	2.651	2.198	2.440	
2021-09-19	22.349	23.613	23.312	22.944	26.308	23.463	23.513	23.630	nan	nan	836.333	3.374	3.178	3.427	3.553	3.174	3.145	3.411	3.600	4.007	3.850	2.593	
2021-09-26	12.512	8.043	9.280	8.029	7.974	8.300	8.163	8.714	6.061	6.013	748.308	2.800	3.011	2.753	3.244	2.803	2.851	2.375	2.398	5.236	2.855	2.351	
2021-10-03	7.706	10.162	10.907	10.296	10.439	10.310	10.333	9.890	10.565	10.725	nan	185.889	2.083	1.625	1.387	1.583	1.722	1.250	1.375	1.714	1.619	1.538	1.250
2021-10-10	inf	5.859	6.951	6.192	6.243	6.263	5.873	6.093	6.392	6.422	nan	235.024	2.182	1.438	1.273	2.250	1.143	1.636	1.250	1.167	4.824	1.222	1.685
2021-10-17	57.032	5.749	5.487	5.960	5.966	5.874	5.782	5.785	6.001	6.018	nan	210.809	1.000	1.300	1.200	1.182	1.273	1.556	1.143	1.286	5.750	1.333	1.333
2021-10-24	111.286	4.177	nan	4.169	4.248	4.220	4.144	4.230	4.201	4.227	1.650	82.049	1.345	1.328	1.323	1.667	1.517	1.385	1.333	1.243	3.878	1.171	1.377
2021-10-31	10.531	4.236	4.591	4.251	4.413	4.362	4.264	4.328	4.747	4.439	1.841	59.203	1.115	1.577	4.071	1.231	1.154	1.600	3.067	2.600	6.000	1.217	8.938
2021-11-07	inf	2.789	3.319	2.810	3.451	2.826	2.791	3.158	2.632	2.889	5.471	75.091	1.405	1.750	1.283	1.712	1.222	1.200	2.462	1.185	13.271	1.242	7.429
2021-11-14	inf	2.174	4.844	4.216	nan	4.264	4.143	4.577	4.236	4.334	3.039	130.000	1.125	1.944	1.929	1.200	1.333	1.200	7.833	1.333	2.458	1.385	2.333
2021-11-21	49.327	3.506	3.353	3.027	3.254	3.096	2.954	3.069	3.102	3.084	2.882	78.500	1.100	1.429	1.091	2.857	1.125	2.000	1.500	1.000	1.533	1.286	1.714
2021-11-28	10.457	2.589	2.299	2.093	2.118	2.107	2.071	2.266	2.110	2.084	2.774	52.755	2.776	5.283	1.508	9.127	1.465	4.487	1.816	1.286	4.600	1.541	6.804
2021-12-05	1.519	5.559	2.166	1.695	1.745	1.784	1.693	2.072	1.706	1.733	5.526	28.850	14.880	6.065	11.398	15.042	14.989	20.632	20.467	21.934	18.384	20.304	27.015
2021-12-12	nan	4.841	2.506	2.106	2.168	2.191	2.092	2.449	2.124	2.102	5.567	66.147	1.280	1.216	8.562	7.821	1.500	6.083	5.240	24.450	12.200	6.316	38.080
2021-12-19	1.265	1.689	2.523	2.235	2.253	2.279	2.208	2.482	2.261	2.235	1.595	58.928	1.174	1.053	1.089	1.154	1.125	1.857	1.200	13.400	1.259	1.200	1.250
2021-12-26	inf	12.812	2.446	1.909	2.065	1.987	1.940	2.168	1.973	2.207	4.019	10.039	25.306	6.327	3.972	3.495	2.373	10.889	1.820	31.423	45.446	16.782	1.391



Weekly cache hits size (shared data size) in TB

index	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnet01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache10	Xcache11	Total
2021-06-27	0.121	7.820	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.307	3.490	3.349	3.479	3.474	1.619	3.053	3.175	3.262	3.300	3.191	4.958	47.597
2021-07-04	0.165	20.925	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.245	8.574	8.667	8.570	8.576	1.519	8.246	8.821	8.456	7.148	7.830	13.410	117.151
2021-07-11	0.272	21.267	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.500	8.985	9.463	8.719	8.913	6.708	8.500	8.871	8.586	7.133	8.653	13.633	124.202
2021-07-18	0.183	22.668	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.349	9.644	9.581	9.327	8.975	8.866	8.814	9.079	8.964	9.482	9.342	14.657	136.932
2021-07-25	0.099	15.464	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.236	6.767	6.659	6.710	6.477	6.582	6.569	6.767	6.633	6.565	6.541	11.495	95.564
2021-08-01	0.041	15.464	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.042	5.351	5.844	6.443	5.931	5.576	5.455	6.086	5.904	5.810	5.242	9.880	85.068
2021-08-08	0.079	16.810	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.247	6.378	6.265	6.481	6.255	6.461	6.116	6.477	6.373	6.531	6.322	10.069	92.865
2021-08-15	0.235	28.483	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.737	2.662	2.722	2.652	2.752	2.592	2.578	2.768	2.601	2.948	2.684	4.055	60.469
2021-08-22	2.198	16.344	0.000	4.154	3.728	3.666	3.721	3.971	0.000	0.000	0.000	0.376	0.000	1.120	0.877	1.041	0.949	0.907	0.963	0.941	1.239	0.969	0.902	48.066
2021-08-29	3.518	14.379	0.000	12.481	13.761	13.965	14.201	10.221	0.000	0.000	0.000	0.315	2.482	3.507	3.156	3.348	3.148	2.782	3.141	3.035	3.541	2.957	3.524	117.462
2021-09-05	0.047	14.745	3.332	5.300	6.313	14.073	14.764	11.586	0.000	0.000	0.000	0.174	1.802	2.153	1.898	1.935	1.873	1.534	1.801	1.695	2.275	1.885	2.520	91.705
2021-09-12	0.035	4.924	4.736	4.065	0.000	4.717	4.861	5.298	0.000	0.000	0.000	0.174	0.350	0.553	0.340	0.338	0.349	0.266	0.328	0.298	0.571	0.337	0.428	32.968
2021-09-19	1.565	3.230	2.961	3.111	1.619	3.066	3.192	3.260	0.000	0.000	0.000	0.168	0.413	0.556	0.390	0.446	0.402	0.351	0.377	0.402	0.614	0.398	0.171	26.689
2021-09-26	0.833	3.123	2.702	3.286	3.393	3.323	3.365	3.190	1.716	1.725	0.000	0.193	0.205	0.306	0.246	0.295	0.179	0.195	0.170	0.209	0.393	0.205	0.243	29.493
2021-10-03	1.196	1.290	1.314	1.217	1.309	1.239	1.320	1.274	1.228	1.182	0.000	0.173	0.009	0.007	0.011	0.008	0.016	0.003	0.005	0.010	0.012	0.010	0.009	12.840
2021-10-10	0.002	2.245	2.351	2.215	2.129	2.129	2.242	2.376	2.121	2.075	0.000	0.162	0.002	0.004	0.002	0.005	0.002	0.004	0.001	0.000	0.002	0.002	0.024	20.095
2021-10-17	0.924	2.680	0.130	2.607	2.663	2.460	2.575	2.567	2.539	2.586	0.000	0.166	0.000	0.002	0.000	0.002	0.003	0.001	0.000	0.003	0.002	0.001	0.022	21.932
2021-10-24	2.408	8.599	0.000	8.767	8.367	8.937	8.947	8.036	8.647	8.720	0.003	0.213	0.003	0.012	0.006	0.018	0.010	0.009	0.005	0.006	0.018	0.002	0.033	71.765
2021-10-31	2.003	1.324	0.876	1.256	1.211	1.306	1.392	1.327	0.636	1.413	0.166	0.173	0.002	0.008	0.003	0.000	0.001	0.003	0.003	0.000	0.004	0.004	0.002	13.111
2021-11-07	0.000	2.911	5.002	2.698	1.092	2.894	2.727	3.233	2.495	2.896	0.145	0.169	0.017	0.004	0.019	0.025	0.010	0.008	0.006	0.008	0.012	0.011	0.021	26.403
2021-11-14	1.726	1.094	3.367	3.238	0.000	3.239	3.234	3.283	3.068	3.371	0.610	0.167	0.002	0.021	0.009	0.004	0.001	0.003	0.003	0.001	0.024	0.007	0.002	26.474
2021-11-21	1.117	0.050	1.703	1.658	0.705	1.607	1.543	1.544	1.601	1.459	0.043	0.073	0.002	0.004	0.001	0.001	0.000	0.000	0.001	0.000	0.004	0.003	0.001	13.120
2021-11-28	0.421	0.506	5.357	4.700	4.756	4.724	4.790	4.834	4.781	4.760	0.766	0.167	0.016	0.019	0.016	0.025	0.016	0.016	0.019	0.004	0.014	0.014	0.020	40.742
2021-12-05	0.030	0.355	6.588	5.621	6.232	6.235	6.208	5.451	6.068	6.423	0.397	0.182	0.026	0.048	0.025	0.031	0.023	0.026	0.022	0.032	0.055	0.026	0.051	50.154
2021-12-12	0.000	0.045	1.332	1.324	1.352	1.421	1.438	1.454	1.349	1.353	0.045	0.043	0.004	0.004	0.006	0.008	0.001	0.004	0.007	0.013	0.005	0.016	0.016	11.231
2021-12-19	0.001	0.108	2.517	2.543	2.596	2.678	2.492	2.131	2.561	2.496	0.100	0.161	0.003	0.000	0.003	0.003	0.002	0.000	0.000	0.003	0.004	0.002	0.002	20.409
2021-12-26	0.000	0.151	1.702	1.993	2.002	2.027	2.046	2.190	1.946	2.456	0.182	0.135	0.073	0.056	0.050	0.042	0.053	0.048	0.038	0.055	0.084	0.050	0.032	17.412
2022-01-02	2.168	0.402	7.101	7.202	7.009	9.112	7.852	7.053	7.007	7.368	0.233	0.151	0.016	0.012	0.019	0.012	0.007	0.009	0.013	0.003	0.020	0.006	0.003	62.776
2022-01-09	1.961	1.227	6.389	4.844	1.802	4.968	4.798	5.129	4.803	5.100	0.574	0.096	0.034	0.040	0.033	0.034	0.035	0.031	0.041	0.000	0.033	0.030	0.051	42.055
2022-01-16	2.006	0.130	2.845	2.496	2.490	2.455	2.424	2.505	2.547	0.143	0.092	0.000	0.000	0.003	0.004	0.002	0.001	0.004	0.000	0.001	0.003	0.004	0.004	22.611
2022-01-23	2.584	0.037	1.769	1.266	1.252	1.244	1.222	1.280	1.302	0.032	0.049	0.001	0.003	0.000	0.001	0.001	0.004	0.000	0.000	0.006	0.001	0.001	0.001	13.320
2022-01-30	0.000	0.001	0.012	0.008	0.014	0.011	0.010	0.016	0.011	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.102

Weekly cache hits size (shared data size) in proportion

index	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnet01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache10	Xcache11	
2021-06-27	0.254	16.429	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.949	7.332	7.036	7.310	7.298	3.401	6.414	6.671	6.854	6.932	6.704	10.417	
2021-07-04	0.141	17.861	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.331	7.319	7.398	7.316	7.320	1.296	7.039	7.529	7.218	6.102	6.684	11.447	
2021-07-11	0.219	17.123	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.623	7.234	7.619	7.020	7.176	5.400	6.844	7.142	6.913	5.743	6.967	10.976	
2021-07-18	0.133	16.554	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.367	7.043	6.997	6.812	6.555	6.475	6.437	6.631	6.546	6.925	6.822	10.704	
2021-07-25	0.104	16.182	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.340	7.081	6.968	7.022	6.778	6.887	6.874	7.081	6.941	6.870	6.845	12.028	
2021-08-01	0.048	18.178	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.400	6.290	6.869	7.574	6.972	6.555	6.412	7.155	6.940	6.829	6.162	11.614	
2021-08-08	0.085	18.102	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.420	6.868	6.746	6.979	6.736	6.958	6.586	6.975	6.863	7.033	6.808	10.842	
2021-08-15	0.389	47.104	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.218	4.403	4.502	4.386	4.551	4.286	4.264	4.577	4.301	4.875	4.439	6.706	
2021-08-22	4.573	34.003	0.000	8.643	7.757	7.626	7.741	8.262	0.000	0.000	0.000	0.783	0.000	2.330	1.825	2.166	1.973	1.886	2.004	1.959	2.577	2.015	1.876	
2021-08-29	2.995	12.241	0.000	10.625	11.715	11.889	12.090	8.701	0.000	0.000	0.000	0.268	2.113	2.986	2.687	2.850	2.680	2.368	2.674	2.584	3.014	2.518	3.000	
2021-09-05	0.051	16.079	3.633	5.780	6.884	15.346	16.100	12.634	0.000	0.000	0.000	0.190	1.966	2.348	2.070	2.110	2.042	1.673	1.964	1.848	2.480	2.055	2.748	
2021-09-12	0.106	14.936	14.364	12.330	0.000	14.307	14.745	16.070	0.000	0.000	0.000	0.529	1.061	1.677	1.031	1.026	1.059	0.807	0.994	0.905	1.733	1.023	1.299	
2021-09-19	5.863	12.103	11.093	11.655	6.066	11.488	11.958	12.216	0.000	0.000	0.000	0.631	1.547	2.082	1.460	1.669	1.505	1.315	1.413	1.505	2.300	1.491	0.639	
2021-09-26	2.825	10.590	9.161	11.141	11.505	11.266	11.410	10.815	5.817	5.849	0.000	0.654	0.693	1.036	0.834	1.001	0.606	0.661	0.576	0.708	1.333	0.697	0.823	
2021-10-03	9.316	10.043	10.236	9.475	10.193	9.649	10.283	9.920	9.561	9.205	0.000	1.351	0.068	0.051	0.084	0.064	0.123	0.021	0.036	0.077	0.093	0.080	0.071	
2021-10-10	0.011	11.171	11.698	11.020	10.594	10.595	11.158	11.823	10.556	10.326	0.000	0.805	0.011	0.018	0.008	0.027	0.011	0.022	0.004	0.000	0.011	0.011	0.121	
2021-10-17	4.214	12.218	0.591	11.885	12.143	11.215	11.742	11.705	11.576	11.791	0.000	0.758	0.000	0.008	0.001	0.008	0.012	0.005	0.002	0.012	0.009	0.005	0.099	
2021-10-24	3.356	11.982	0.000	12.216	11.658	12.453	12.467	11.197	12.049	12.151	0.004	0.297	0.004	0.017	0.009	0.025	0.013	0.013	0.007	0.009	0.025	0.003	0.046	
2021-10-31	15.279	10.096	6.678	9.580	9.239	9.959	10.621	10.117	4.853	10.777	1.262	1.318	0.017	0.060	0.019	0.003	0.004	0.019	0.022	0.003	0.028	0.029	0.016	
2021-11-07	0.000	11.026	18.946	10.218	4.134	10.960	10.327	12.245	9.451	10.970	0.548	0.642	0.065	0.015	0.071	0.094	0.038	0.031	0.022	0.028	0.045	0.042	0.080	
2021-11-14	6.518	4.132	12.719	12.231	0.000	12.234	12.215	12.399	11.587	12.735	2.305	0.629	0.007	0.080	0.036	0.015	0.004	0.011	0.013	0.006	0.090	0.026	0.009	
2021-11-21	8.511	0.378	12.979	12.640	5.372	12.247	11.757	11.772	12.205	11.119	0.327	0.557	0.017	0.028	0.010	0.009	0.001	0.000	0.010	0.000	0.033	0.025	0.004	
2021-11-28	1.034	1.241	13.150	11.535	11.674	11.595	11.757	11.864	11.736	11.684	1.881	0.410	0.039	0.047	0.038	0.062	0.038	0.040	0.046	0.046	0.010	0.035	0.034	0.049
2021-12-05	0.060	0.708	13.136	11.208	12.426	12.431	12.378	10.868	12.099	12.806	0.791	0.362	0.051	0.096	0.049	0.061	0.046	0.052	0.043	0.064	0.109	0.053	0.102	
2021-12-12	0.000	0.404	11.862	11.791	12.042	12.651	12.803	12.951	12.009	12.048	0.402	0.382	0.032	0.036	0.051	0.050	0.073	0.013	0.035	0.064	0.116	0.040	0.145	
2021-12-19	0.006	0.529	12.334	12.458	12.721	13.122	12.208	10.443	12.549	12.232	0.491	0.787	0.017	0.001	0.014	0.016	0.009	0.002	0.001	0.017	0.022	0.011	0.011	
2021-12-26	0.001	0.868	9.773	11.445	11.499	11.644	11.749	12.579	11.177	14.103	1.048	0.775	0.421	0.320	0.289	0.240	0.305	0.276	0.218	0.317	0.480	0.290	0.184	
2022-01-02	3.453	0.641	11.312	11.472	11.165	14.516	12.508	11.235	11.162	11.737	0.371	0.240	0.025	0.019	0.030	0.019	0.011	0.014	0.021	0.005	0.031	0.009	0.005	
2022-01-09	4.662	2.918	15.192	11.519	4.286	11.814	11.409	12.196	11.420	12.127	1.365	0.229	0.080	0.096	0.079	0.081	0.082	0.073	0.098	0.000	0.079	0.072	0.122	
2022-01-16	8.874	0.574	12.584	11.040	11.013	10.859	10.858	10.719	11.076	11.266	0.633	0.407	0.000	0.000	0.014	0.018	0.008	0.006	0.018	0.000	0.004	0.013	0.016	
2022-01-23	19.399	0.276	13.278	9.504	9.503	9.397	9.339	9.177	9.608	9.776	0.242	0.368	0.010	0.021	0.000	0.006	0.008	0.031	0.002	0.000	0.044	0.004	0.005	
2022-01-30	0.000	1.205	12.085	7.879	14.078	13.334	10.635	10.172	15.641	10.888	0.016	4.066	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	



Weekly cache misses size (data transfer size) in TB

index	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnet01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache10	Xcache11	Total
2021-06-27	0.306	13.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.038	5.519	5.838	5.531	5.352	3.078	4.999	5.280	5.092	5.452	5.668	6.842	79.496
2021-07-04	0.976	15.679	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.714	6.164	6.933	6.370	6.292	1.785	6.056	6.733	6.788	5.716	6.666	11.096	92.969
2021-07-11	0.003	11.671	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.402	5.064	5.326	4.997	5.083	4.102	4.385	4.983	4.838	3.941	5.287	7.041	69.123
2021-07-18	0.018	16.350	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.809	6.366	6.504	6.173	6.678	6.921	6.333	6.745	6.608	6.198	6.124	11.174	96.001
2021-07-25	0.301	8.816	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.034	3.356	3.502	3.491	3.447	3.374	3.434	3.484	3.432	3.481	3.418	5.904	50.475
2021-08-01	0.094	9.982	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.353	4.136	4.065	4.230	4.110	4.133	3.971	4.201	3.939	4.250	4.017	6.371	58.851
2021-08-08	0.315	12.475	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.027	5.228	5.079	5.176	5.400	5.209	4.933	5.033	5.092	5.237	5.114	7.531	73.849
2021-08-15	0.514	12.902	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.410	1.624	1.548	1.628	1.635	1.588	1.359	1.519	1.557	1.678	1.521	2.516	31.997
2021-08-22	0.592	10.405	0.000	2.456	2.355	2.424	2.519	2.015	0.000	0.000	0.000	0.025	0.000	0.471	0.378	0.429	0.433	0.424	0.415	0.381	0.512	0.406	0.473	27.114
2021-08-29	0.014	18.552	0.000	15.542	16.130	17.842	18.850	7.454	0.000	0.000	0.000	0.164	1.948	2.617	2.387	2.471	2.378	2.118	2.408	2.308	2.838	2.238	3.538	121.794
2021-09-05	0.148	11.278	0.751	1.793	6.196	10.400	11.463	5.398	0.000	0.000	0.000	0.016	1.196	1.372	1.256	1.346	1.245	1.035	1.302	1.209	1.500	1.139	1.564	61.605
2021-09-12	0.126	3.387	2.929	2.808	0.000	3.090	3.098	3.053	0.000	0.000	0.000	0.001	0.233	0.255	0.207	0.273	0.222	0.202	0.241	0.187	0.287	0.216	0.170	20.985
2021-09-19	0.013	1.214	1.157	1.187	0.637	1.173	1.118	1.213	0.000	0.000	0.000	0.002	0.154	0.249	0.144	0.184	0.156	0.159	0.157	0.129	0.197	0.147	0.109	9.497
2021-09-26	0.003	5.912	4.729	5.848	5.894	5.645	5.677	5.356	4.854	4.951	0.000	0.016	0.091	0.120	0.102	0.087	0.081	0.086	0.084	0.097	0.117	0.094	0.107	49.950
2021-10-03	0.021	5.645	5.226	5.472	5.463	5.617	5.469	5.718	5.342	5.171	0.000	0.101	0.012	0.026	0.029	0.019	0.023	0.017	0.012	0.013	0.032	0.028	0.035	49.494
2021-10-10	0.000	10.380	8.715	9.799	9.850	9.970	10.333	10.081	9.394	9.451	0.000	0.063	0.009	0.014	0.012	0.007	0.008	0.011	0.006	0.006	0.011	0.023	0.113	88.256
2021-10-17	0.008	11.825	0.787	11.160	11.386	11.559	11.885	11.694	11.291	11.056	0.000	0.087	0.012	0.011	0.002	0.012	0.009	0.014	0.007	0.011	0.007	0.010	0.085	92.920
2021-10-24	0.000	18.523	0.000	19.005	18.103	18.365	19.055	17.764	18.381	18.221	0.020	0.286	0.036	0.083	0.031	0.027	0.026	0.038	0.031	0.046	0.065	0.046	0.169	148.322
2021-10-31	0.003	17.359	10.557	17.186	16.557	16.638	17.372	16.552	7.290	16.444	0.312	0.365	0.014	0.021	0.003	0.005	0.005	0.001	0.013	0.017	0.032	0.011	0.012	136.772
2021-11-07	0.000	38.493	29.363	38.337	11.019	37.885	38.365	28.201	34.449	36.909	0.445	0.344	0.036	0.041	0.074	0.055	0.037	0.041	0.052	0.034	0.059	0.039	0.073	294.353
2021-11-14	0.000	4.506	15.303	18.855	0.000	18.317	19.241	16.475	18.614	18.044	0.553	0.161	0.010	0.014	0.010	0.019	0.011	0.005	0.009	0.004	0.029	0.005	0.004	130.190
2021-11-21	0.000	0.106	7.314	8.583	5.005	8.254	8.885	8.344	8.179	8.394	0.088	0.140	0.010	0.018	0.005	0.009	0.005	0.002	0.004	0.000	0.019	0.004	0.003	63.370
2021-11-28	0.008	0.862	27.901	33.509	32.730	33.031	33.421	28.410	32.618	33.249	1.110	0.392	0.045	0.057	0.052	0.037	0.046	0.031	0.040	0.014	0.027	0.039	0.027	257.655
2021-12-05	0.221	1.246	42.343	92.529	87.314	74.008	90.658	42.643	89.836	88.435	1.226	0.984	0.071	0.122	0.040	0.057	0.048	0.042	0.050	0.062	0.107	0.057	0.048	612.147
2021-12-12	0.000	0.130	7.169	11.152	10.624	10.220	11.126	7.850	10.569	10.979	0.132	0.088	0.009	0.017	0.013	0.008	0.007	0.010	0.011	0.015	0.007	0.012	80.161	
2021-12-19	0.031	0.314	25.572	31.987	31.353	30.971	32.782	23.453	31.119	31.575	0.369	0.361	0.012	0.006	0.015	0.013	0.012	0.010	0.004	0.004	0.017	0.005	0.004	239.990
2021-12-26	0.000	0.317	9.836	15.539	15.123	13.493	14.693	13.546	15.012	18.047	0.429	0.913	0.122	0.098	0.115	0.106	0.104	0.126	0.109	0.082	0.119	0.099	0.120	118.148
2022-01-02	0.000	0.663	39.895	85.678	60.922	82.054	84.041	68.974	84.761	78.409	0.434	0.831	0.028	0.032	0.033	0.051	0.028	0.028	0.025	0.003	0.021	0.024	0.034	586.970
2022-01-09	0.063	1.439	52.987	103.533	40.782	99.698	104.247	93.677	101.339	101.571	0.585	0.550	0.039	0.043	0.036	0.032	0.035	0.046	0.049	0.000	0.041	0.025	0.052	700.869
2022-01-16	0.011	0.256	77.342	90.989	89.362	88.477	92.417	85.680	89.915	89.681	0.193	2.595	0.007	0.003	0.003	0.001	0.007	0.002	0.003	0.000	0.005	0.004	0.007	706.955
2022-01-23	0.001	0.074	20.977	26.441	25.664	25.907	26.341	26.277	25.646	26.255	0.105	0.341	0.002	0.004	0.000	0.005	0.004	0.001	0.006	0.000	0.005	0.003	0.002	204.061
2022-01-30	0.000	0.001	0.367	0.410	0.425	0.423	0.436	0.374	0.441	0.435	0.001	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.325	



Weekly cache misses size (data transfer size) in proportion

index	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnet01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache10	Xcache11
2021-06-27	0.384	16.982	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.853	6.943	7.344	6.957	6.733	3.872	6.289	6.642	6.405	6.858	7.130	8.606
2021-07-04	1.050	16.865	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.147	6.630	7.457	6.852	6.768	1.920	6.514	7.242	7.302	6.149	7.170	11.935
2021-07-11	0.005	16.885	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.475	7.326	7.704	7.230	7.354	5.935	6.343	7.208	7.000	5.701	7.649	10.186
2021-07-18	0.019	17.031	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.967	6.631	6.775	6.430	6.956	7.210	6.597	7.026	6.883	6.456	6.379	11.640
2021-07-25	0.596	17.467	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.048	6.649	6.939	6.917	6.829	6.685	6.802	6.903	6.799	6.897	6.771	11.697
2021-08-01	0.159	16.961	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.299	7.028	6.907	7.188	6.984	7.022	6.747	7.139	6.693	7.221	6.826	10.826
2021-08-08	0.426	16.893	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.745	7.080	6.878	7.009	7.312	7.053	6.679	6.816	6.895	7.091	6.925	10.198
2021-08-15	1.606	40.321	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.283	5.074	4.838	5.087	5.108	4.962	4.246	4.746	4.866	5.245	4.755	7.863
2021-08-22	2.183	38.376	0.000	9.058	8.685	8.941	9.290	7.432	0.000	0.000	0.000	0.092	0.000	1.739	1.395	1.580	1.596	1.565	1.530	1.406	1.888	1.499	1.744
2021-08-29	0.012	15.232	0.000	12.761	13.244	14.650	15.477	6.120	0.000	0.000	0.000	0.134	1.600	2.149	1.959	2.029	1.952	1.739	1.977	1.895	2.330	1.837	2.905
2021-09-05	0.240	18.307	1.219	2.911	10.057	16.882	18.607	8.762	0.000	0.000	0.000	0.025	1.941	2.227	2.038	2.185	2.020	1.681	2.113	1.963	2.435	1.848	2.538
2021-09-12	0.599	16.142	13.957	13.379	0.000	14.727	14.762	14.547	0.000	0.000	0.000	0.007	1.111	1.214	0.987	1.302	1.057	0.962	1.150	0.890	1.366	1.031	0.811
2021-09-19	0.134	12.781	12.181	12.498	6.705	12.349	11.767	12.775	0.000	0.000	0.000	0.025	1.618	2.621	1.512	1.942	1.640	1.675	1.648	1.354	2.070	1.552	1.153
2021-09-26	0.006	11.835	9.467	11.707	11.799	11.301	11.366	10.722	9.718	9.911	0.000	0.031	0.183	0.241	0.205	0.175	0.162	0.173	0.168	0.194	0.235	0.187	0.214
2021-10-03	0.042	11.406	10.558	11.057	11.038	11.348	11.051	11.552	10.792	10.449	0.000	0.204	0.025	0.053	0.059	0.039	0.047	0.035	0.024	0.026	0.065	0.057	0.071
2021-10-10	0.000	11.761	9.875	11.103	11.161	11.297	11.708	11.423	10.645	10.708	0.000	0.071	0.010	0.016	0.014	0.008	0.009	0.012	0.006	0.007	0.012	0.026	0.128
2021-10-17	0.008	12.726	0.847	12.010	12.254	12.440	12.791	12.586	12.152	11.898	0.000	0.094	0.013	0.012	0.002	0.013	0.010	0.015	0.007	0.012	0.007	0.011	0.092
2021-10-24	0.000	12.488	0.000	12.814	12.205	12.382	12.847	11.977	12.393	12.285	0.013	0.193	0.024	0.056	0.021	0.018	0.017	0.026	0.021	0.031	0.044	0.031	0.114
2021-10-31	0.002	12.692	7.719	12.566	12.106	12.165	12.701	12.102	5.330	12.023	0.228	0.267	0.010	0.015	0.002	0.004	0.004	0.001	0.009	0.012	0.023	0.008	0.009
2021-11-07	0.000	13.077	9.975	13.024	3.743	12.871	13.034	9.581	11.703	12.539	0.151	0.117	0.012	0.014	0.025	0.019	0.013	0.014	0.018	0.012	0.020	0.013	0.025
2021-11-14	0.000	3.461	11.754	14.483	0.000	14.070	14.779	12.655	14.297	13.860	0.425	0.124	0.008	0.011	0.008	0.015	0.008	0.004	0.007	0.003	0.023	0.004	0.003
2021-11-21	0.000	0.167	11.542	13.544	7.898	13.025	14.021	13.167	12.906	13.246	0.139	0.222	0.015	0.029	0.007	0.015	0.008	0.003	0.006	0.000	0.030	0.006	0.004
2021-11-28	0.003	0.335	10.829	13.005	12.703	12.820	12.971	11.026	12.660	12.904	0.431	0.152	0.017	0.022	0.020	0.014	0.018	0.012	0.015	0.005	0.010	0.015	0.010
2021-12-05	0.036	0.204	6.917	15.115	14.264	12.090	14.810	6.966	14.676	14.447	0.200	0.161	0.012	0.020	0.007	0.009	0.008	0.007	0.008	0.010	0.017	0.009	0.008
2021-12-12	0.000	0.162	8.944	13.912	13.253	12.750	13.880	9.792	13.185	13.696	0.164	0.109	0.011	0.022	0.016	0.016	0.011	0.009	0.012	0.014	0.019	0.009	0.015
2021-12-19	0.013	0.131	10.655	13.329	13.064	12.905	13.660	9.773	12.967	13.157	0.154	0.150	0.005	0.003	0.006	0.005	0.005	0.004	0.002	0.002	0.007	0.002	0.002
2021-12-26	0.000	0.268	8.325	13.152	12.800	11.421	12.436	11.465	12.706	15.275	0.363	0.772	0.103	0.083	0.097	0.090	0.088	0.107	0.092	0.070	0.101	0.084	0.102
2022-01-02	0.000	0.113	6.797	14.597	10.379	13.979	14.318	11.751	14.440	13.358	0.074	0.142	0.005	0.005	0.006	0.009	0.005	0.005	0.004	0.001	0.004	0.004	0.006
2022-01-09	0.009	0.205	7.560	14.772	5.819	14.225	14.874	13.366	14.459	14.492	0.083	0.078	0.006	0.006	0.005	0.005	0.005	0.007	0.007	0.000	0.006	0.004	0.007
2022-01-16	0.002	0.036	10.940	12.871	12.640	12.515	13.073	12.120	12.719	12.686	0.027	0.367	0.001	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001
2022-01-23	0.000	0.036	10.280	12.958	12.577	12.696	12.908	12.877	12.568	12.866	0.051	0.167	0.001	0.002	0.000	0.002	0.001	0.003	0.000	0.002	0.002	0.001	0.001
2022-01-30	0.000	0.032	11.050	12.339	12.784	12.724	13.099	11.253	13.261	13.090	0.025	0.344	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000



Weekly shared data rates

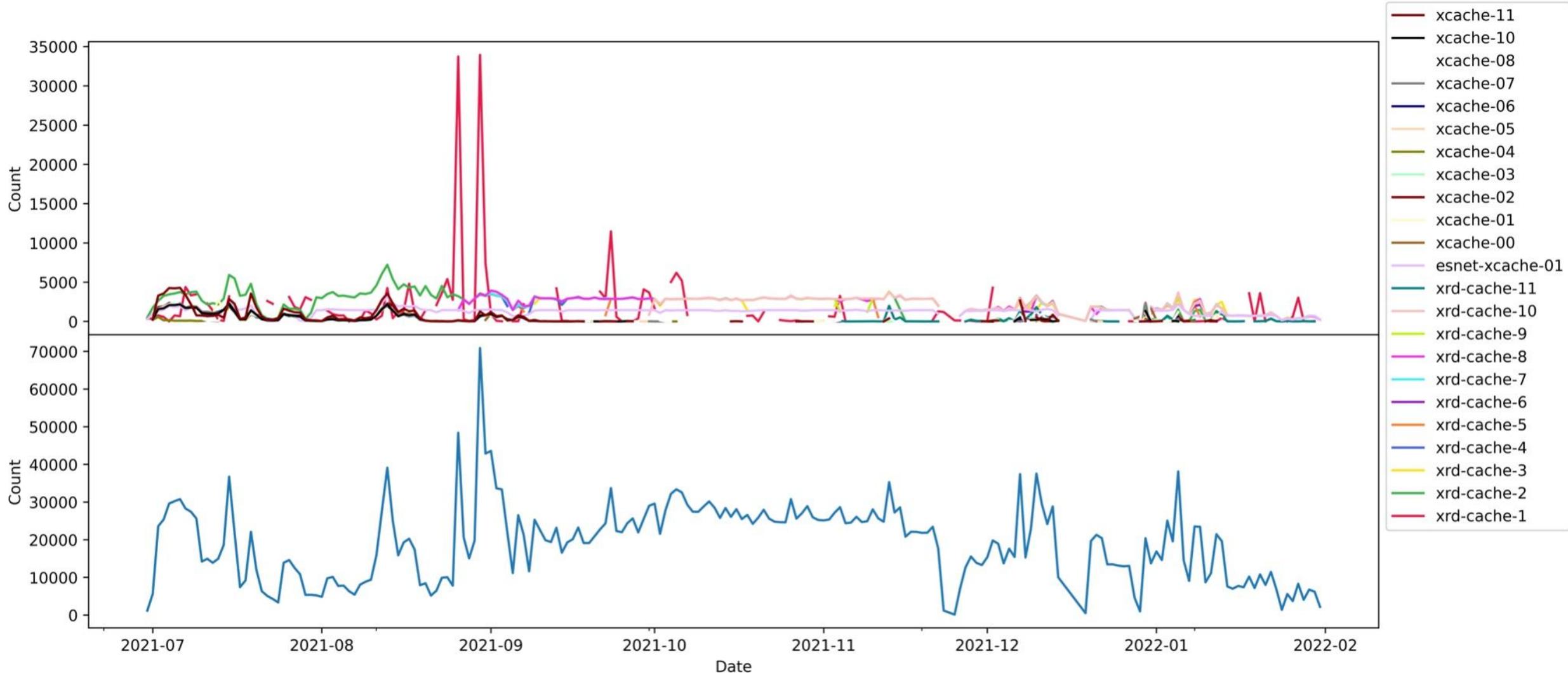
index	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnet01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache10	Xcache11		
2021-06-27	28.363	36.678	nan	nan	nan	nan	nan	nan	31.970	38.736	36.452	38.615	39.358	34.461	37.914	37.551	39.047	37.704	36.017	42.018					
2021-07-04	14.488	57.165	nan	nan	nan	nan	nan	nan	52.219	58.176	55.560	57.364	57.679	45.967	57.655	56.713	55.468	55.565	54.014	54.721					
2021-07-11	98.755	64.566	nan	nan	nan	nan	nan	nan	65.202	63.954	63.988	63.567	63.681	62.051	65.970	64.034	63.959	64.414	62.074	65.943					
2021-07-18	90.925	58.097	nan	nan	nan	nan	nan	nan	65.867	60.236	59.563	60.174	57.337	56.159	58.190	57.377	57.567	60.474	60.403	56.742					
2021-07-25	24.739	63.690	nan	nan	nan	nan	nan	nan	68.384	66.846	65.533	65.775	65.266	66.109	65.674	66.013	65.902	65.350	65.682	66.065					
2021-08-01	30.471	60.772	nan	nan	nan	nan	nan	nan	60.142	56.405	58.977	60.365	59.068	57.436	57.871	59.163	59.983	57.754	56.614	60.796					
2021-08-08	20.148	57.401	nan	nan	nan	nan	nan	nan	52.575	54.952	55.226	55.596	53.668	55.366	55.356	56.271	55.586	55.501	55.282	57.209					
2021-08-15	31.396	68.825	nan	nan	nan	nan	nan	nan	64.215	62.115	63.747	61.970	62.739	62.010	65.490	64.569	62.553	63.724	63.825	61.711					
2021-08-22	78.784	61.101	nan	62.846	61.288	60.192	59.631	66.338	nan	nan	93.776	nan	70.374	69.871	70.839	68.667	68.125	69.904	71.174	70.756	70.450	65.604			
2021-08-29	99.594	43.663	nan	44.539	46.037	43.905	42.968	57.827	nan	nan	65.811	56.021	57.270	56.939	57.536	56.973	56.780	56.610	56.812	55.511	56.925	49.903			
2021-09-05	24.099	56.661	81.612	74.719	50.470	57.504	56.294	68.219	nan	nan	91.793	60.114	61.079	60.181	58.973	60.074	59.698	58.045	58.355	60.257	62.337	61.712			
2021-09-12	21.683	59.245	61.786	59.149	nan	60.416	61.078	63.444	nan	nan	99.195	59.995	68.455	62.127	55.302	61.150	56.871	57.572	61.508	66.589	60.908	71.552			
2021-09-19	99.191	72.686	71.903	72.380	71.771	72.332	74.066	72.879	nan	nan	98.592	72.877	69.066	73.062	70.724	72.050	68.813	70.672	75.753	75.747	72.975	60.915			
2021-09-26	99.632	34.568	36.361	35.975	36.538	37.052	37.214	37.326	26.113	25.840	nan	92.491	69.090	71.751	70.584	77.205	68.879	69.281	66.931	68.343	77.042	68.709	69.422		
2021-10-03	98.290	18.594	20.096	18.187	19.325	18.071	19.446	18.217	18.687	18.603	nan	63.158	41.400	19.943	26.982	30.050	40.366	13.321	27.869	43.916	27.115	26.487	20.446		
2021-10-10	100.000	17.781	21.242	18.433	17.772	17.598	17.830	19.072	18.420	18.003	nan	72.090	20.898	21.152	12.106	42.652	21.742	28.858	11.938	0.002	16.770	8.592	17.665		
2021-10-17	99.193	18.474	14.134	18.934	18.956	17.545	17.808	18.000	18.357	18.956	nan	65.662	0.000	13.736	14.756	12.939	22.318	7.159	5.289	18.812	22.156	9.396	20.284		
2021-10-24	100.000	31.704	nan	31.566	31.608	32.734	31.952	31.146	31.993	32.367	11.724	42.661	7.613	12.475	17.143	39.606	27.203	19.430	13.100	12.322	21.589	4.850	16.260		
2021-10-31	99.844	7.086	7.658	6.811	6.817	7.277	7.421	7.419	8.028	7.913	34.632	32.121	13.934	27.072	42.772	6.128	9.302	75.998	18.235	2.136	10.325	25.454	14.417		
2021-11-07	100.000	7.031	14.557	6.574	9.013	7.096	6.636	10.285	6.754	7.276	24.548	33.008	32.405	8.906	20.145	30.933	21.253	16.528	10.307	17.949	16.795	22.372	22.429		
2021-11-14	100.000	19.533	18.035	14.656	nan	15.026	14.389	16.614	14.148	15.743	52.445	50.770	16.092	60.251	48.456	16.869	9.178	37.042	28.163	28.947	44.733	60.574	35.739		
2021-11-21	100.000	31.868	18.885	16.193	12.346	16.295	14.793	15.619	16.373	14.806	32.829	34.209	18.889	16.667	22.221	11.040	2.439	0.005	27.027	0.000	18.693	45.282	16.000		
2021-11-28	98.044	36.964	16.108	12.300	12.688	12.512	12.536	14.540	12.785	12.524	40.845	29.862	26.341	25.203	23.010	40.402	25.427	34.299	32.087	23.027	34.814	26.121	42.793		
2021-12-05	12.016	22.191	13.464	5.727	6.662	7.770	6.409	11.333	6.327	6.771	24.448	15.581	26.671	28.147	38.235	34.855	32.366	38.623	30.377	34.053	33.910	31.584	51.772		
2021-12-12	nan	25.953	15.670	10.614	11.292	12.205	11.444	15.632	11.317	10.972	25.497	32.906	29.670	19.005	31.198	29.928	49.089	17.710	28.431	39.082	46.782	37.828	56.846		
2021-12-19	3.611	25.595	8.962	7.363	7.647	7.959	7.064	8.330	7.604	7.327	21.350	30.791	22.413	2.128	15.788	19.999	13.084	3.783	6.050	43.235	21.082	32.730	35.505		
2021-12-26	100.000	32.288	14.748	11.367	11.692	13.063	12.221	13.918	11.476	11.977	29.849	12.884	37.578	36.179	30.495	28.259	33.816	27.534	25.900	40.138	41.276	33.796	20.999		
2022-01-02	100.000	37.783	15.110	7.754	10.318	9.995	8.545	9.277	7.636	8.590	34.915	15.357	35.972	27.191	35.803	18.656	19.764	23.290	34.624	50.665	48.213	18.992	8.356		
2022-01-09	96.882	46.025	10.760	4.470	4.232	4.747	4.400	5.191	4.525	4.781	49.532	14.914	46.034	48.496	47.771	51.939	49.802	40.112	45.634	nan	44.688	54.534	49.704		
2022-01-16	99.437	33.620	3.548	2.670	2.711	2.700	2.588	2.751	2.710	2.762	42.640	3.426	0.041	0.843	51.035	85.559	20.587	37.159	57.994	nan	63.206	45.169	35.471		
2022-01-23	99.969	33.128	7.776	4.569	4.700	4.609	4.510	4.445	4.753	4.725	23.559	12.573	45.452	41.174	0.020	14.096	21.052	73.808	4.444	nan	55.696	14.815	23.638		
2022-01-30	nan	53.454	3.256	1.927	3.278	3.124	2.438	2.707	3.503	2.496	1.942	26.659	nan	0.000	nan	nan	0.000	nan	nan	nan	nan	nan	nan	nan	



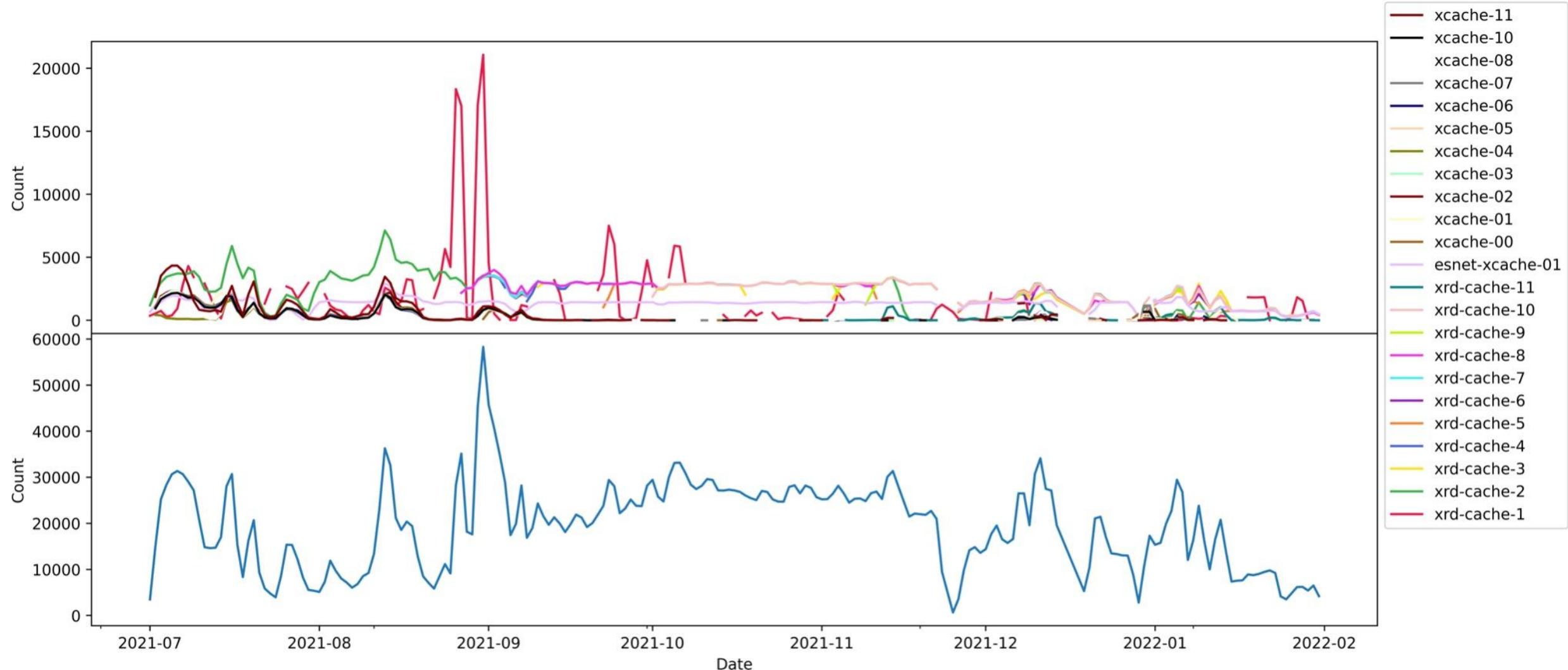
Weekly network traffic demand reduction rate (traffic volume)

index	Xrd1	Xrd2	Xrd3	Xrd4	Xrd5	Xrd6	Xrd7	Xrd8	Xrd9	Xrd10	Xrd11	Esnet01	Xcache00	Xcache01	Xcache02	Xcache03	Xcache04	Xcache05	Xcache06	Xcache07	Xcache08	Xcache10	Xcache11
2021-06-27	1.396	1.579	nan	1.470	1.632	1.574	1.629	1.649	1.526	1.611	1.601	1.641	1.605	1.563	1.725								
2021-07-04	1.169	2.335	nan	2.093	2.391	2.250	2.345	2.363	1.851	2.362	2.310	2.246	2.250	2.175	2.209								
2021-07-11	80.340	2.822	nan	2.874	2.774	2.777	2.745	2.753	2.635	2.939	2.780	2.775	2.810	2.637	2.936								
2021-07-18	11.020	2.386	nan	2.930	2.515	2.473	2.511	2.344	2.281	2.392	2.346	2.357	2.530	2.525	2.312								
2021-07-25	1.329	2.754	nan	3.163	3.016	2.901	2.922	2.879	2.951	2.913	2.942	2.933	2.886	2.914	2.947								
2021-08-01	1.438	2.549	nan	2.509	2.294	2.438	2.523	2.443	2.349	2.374	2.449	2.499	2.367	2.305	2.551								
2021-08-08	1.252	2.347	nan	2.109	2.220	2.233	2.252	2.158	2.240	2.240	2.287	2.252	2.247	2.236	2.337								
2021-08-15	1.458	3.208	nan	2.794	2.640	2.758	2.629	2.684	2.632	2.898	2.822	2.670	2.757	2.764	2.612								
2021-08-22	4.713	2.571	nan	2.691	2.583	2.512	2.477	2.971	nan	nan	16.067	nan	3.375	3.319	3.429	3.192	3.137	3.323	3.469	3.419	3.384	2.907	
2021-08-29	246.407	1.775	nan	1.803	1.853	1.783	1.753	2.371	nan	nan	2.925	2.274	2.340	2.322	2.355	2.324	2.314	2.305	2.315	2.248	2.322	1.996	
2021-09-05	1.318	2.307	5.438	3.956	2.019	2.353	2.288	3.147	nan	nan	12.184	2.507	2.569	2.511	2.437	2.505	2.481	2.383	2.401	2.516	2.655	2.612	
2021-09-12	1.277	2.454	2.617	2.448	nan	2.526	2.569	2.736	nan	nan	124.251	2.500	3.170	2.640	2.237	2.574	2.319	2.357	2.598	2.993	2.558	3.515	
2021-09-19	123.638	3.661	3.559	3.621	3.543	3.614	3.856	3.687	nan	nan	71.010	3.687	3.233	3.712	3.416	3.578	3.206	3.410	4.124	4.123	3.700	2.559	
2021-09-26	271.801	1.528	1.571	1.562	1.576	1.589	1.593	1.596	1.353	1.348	nan	13.317	3.235	3.540	3.400	4.387	3.213	3.255	3.024	3.159	4.356	3.196	3.270
2021-10-03	58.485	1.228	1.252	1.222	1.240	1.221	1.241	1.223	1.230	1.229	nan	2.714	1.706	1.249	1.370	1.430	1.677	1.154	1.386	1.783	1.372	1.360	1.257
2021-10-10	inf	1.216	1.270	1.226	1.216	1.214	1.217	1.236	1.226	1.220	nan	3.583	1.264	1.268	1.138	1.744	1.278	1.406	1.136	1.000	1.201	1.094	1.215
2021-10-17	123.989	1.227	1.165	1.234	1.234	1.213	1.217	1.220	1.225	1.234	nan	2.912	1.000	1.159	1.173	1.149	1.287	1.077	1.056	1.232	1.285	1.104	1.254
2021-10-24	10,463,202.221	1.464	nan	1.461	1.462	1.487	1.470	1.452	1.470	1.479	1.133	1.744	1.082	1.143	1.207	1.656	1.374	1.241	1.151	1.141	1.275	1.051	1.194
2021-10-31	642.148	1.076	1.083	1.073	1.073	1.078	1.080	1.080	1.087	1.086	1.530	1.473	1.162	1.371	1.747	1.065	1.103	4.166	1.223	1.022	1.115	1.341	1.168
2021-11-07	inf	1.076	1.170	1.070	1.099	1.076	1.071	1.115	1.072	1.078	1.325	1.493	1.479	1.098	1.252	1.448	1.270	1.198	1.115	1.219	1.202	1.288	1.289
2021-11-14	inf	1.243	1.220	1.172	nan	1.177	1.168	1.199	1.165	1.187	2.103	2.031	1.192	2.516	1.940	1.203	1.101	1.588	1.392	1.407	1.809	2.536	1.556
2021-11-21	1,759,618.654	1.468	1.233	1.193	1.141	1.195	1.174	1.185	1.196	1.174	1.489	1.520	1.233	1.200	1.286	1.124	1.025	1.000	1.370	1.000	1.230	1.828	1.190
2021-11-28	51.125	1.586	1.192	1.140	1.145	1.143	1.143	1.170	1.147	1.143	1.690	1.426	1.358	1.337	1.299	1.678	1.341	1.522	1.472	1.299	1.534	1.354	1.748
2021-12-05	1.137	1.285	1.156	1.061	1.071	1.084	1.068	1.128	1.068	1.073	1.324	1.185	1.364	1.392	1.619	1.535	1.479	1.629	1.436	1.516	1.513	1.462	2.074
2021-12-12	nan	1.350	1.186	1.119	1.127	1.139	1.129	1.185	1.128	1.123	1.342	1.490	1.422	1.235	1.453	1.427	1.964	1.215	1.397	1.642	1.879	1.608	2.317
2021-12-19	1.037	1.344	1.098	1.079	1.083	1.086	1.076	1.091	1.082	1.079	1.271	1.445	1.289	1.022	1.187	1.250	1.151	1.039	1.064	1.762	1.267	1.487	1.551
2021-12-26	inf	1.477	1.173	1.128	1.132	1.150	1.139	1.162	1.130	1.136	1.426	1.148	1.602	1.567	1.439	1.394	1.511	1.380	1.350	1.671	1.703	1.510	1.266
2022-01-02	inf	1.607	1.178	1.084	1.115	1.111	1.093	1.102	1.083	1.094	1.536	1.181	1.562	1.373	1.558	1.229	1.246	1.304	1.530	2.027	1.931	1.234	1.091
2022-01-09	32.073	1.853	1.121	1.047	1.044	1.050	1.046	1.055	1.047	1.050	1.981	1.175	1.853	1.942	1.915	2.081	1.992	1.670	1.839	nan	1.808	2.199	1.988
2022-01-16	177.622	1.506	1.037	1.027	1.028	1.028	1.027	1.028	1.028	1.028	1.743	1.035	1.000	1.008	2.042	6.925	1.259	1.591	2.381	nan	2.718	1.824	1.550
2022-01-23	3,210.473	1.495	1.084	1.048	1.049	1.048	1.047	1.047	1.050	1.050	1.308	1.144	1.833	1.700	1.000	1.164	1.267	3.818	1.047	nan	2.257	1.174	1.310
2022-01-30	nan	2.148	1.034	1.020	1.034	1.032	1.025	1.028	1.036	1.026	1.020	1.363	nan	1.000	nan	nan	1.000	nan	nan	nan	nan	nan	nan

Data re-use counts with moving average 1 day

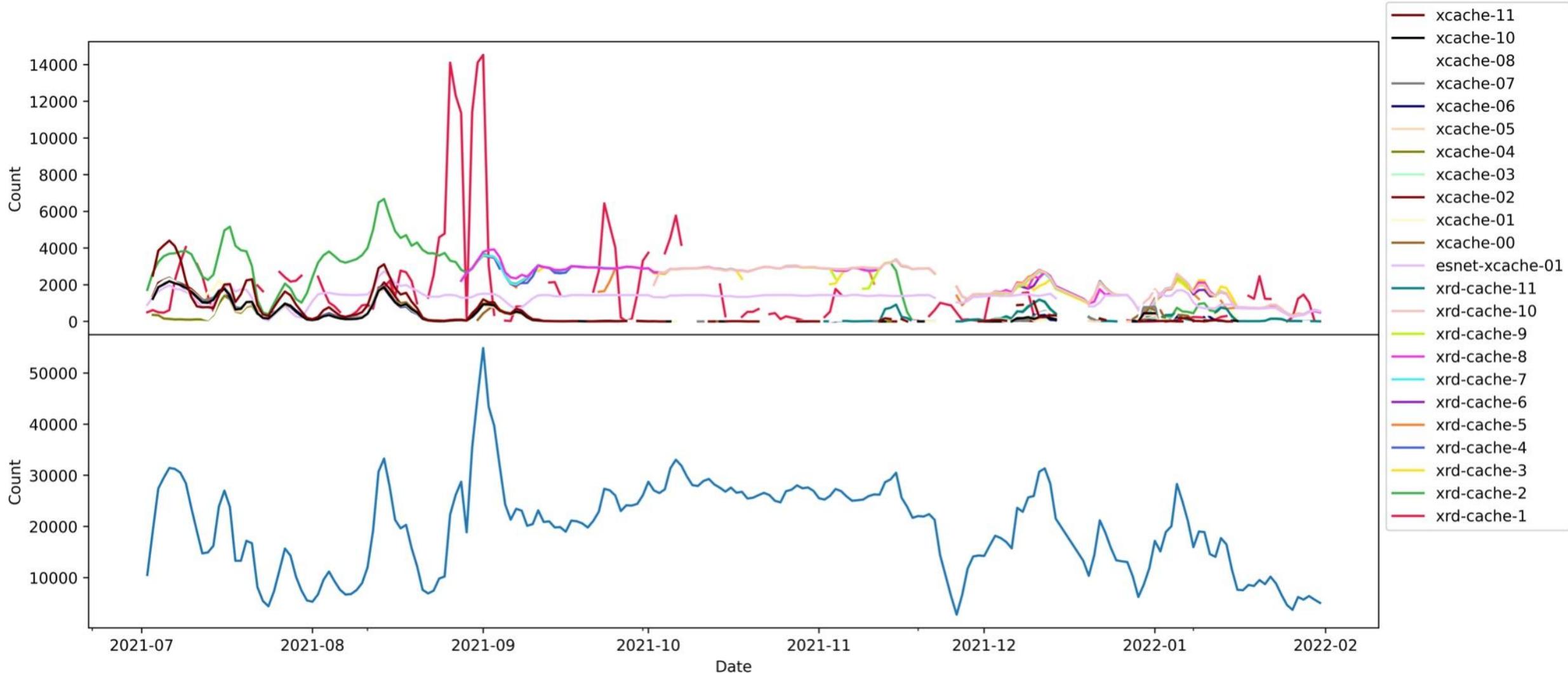


Data re-use counts with moving average 2 days

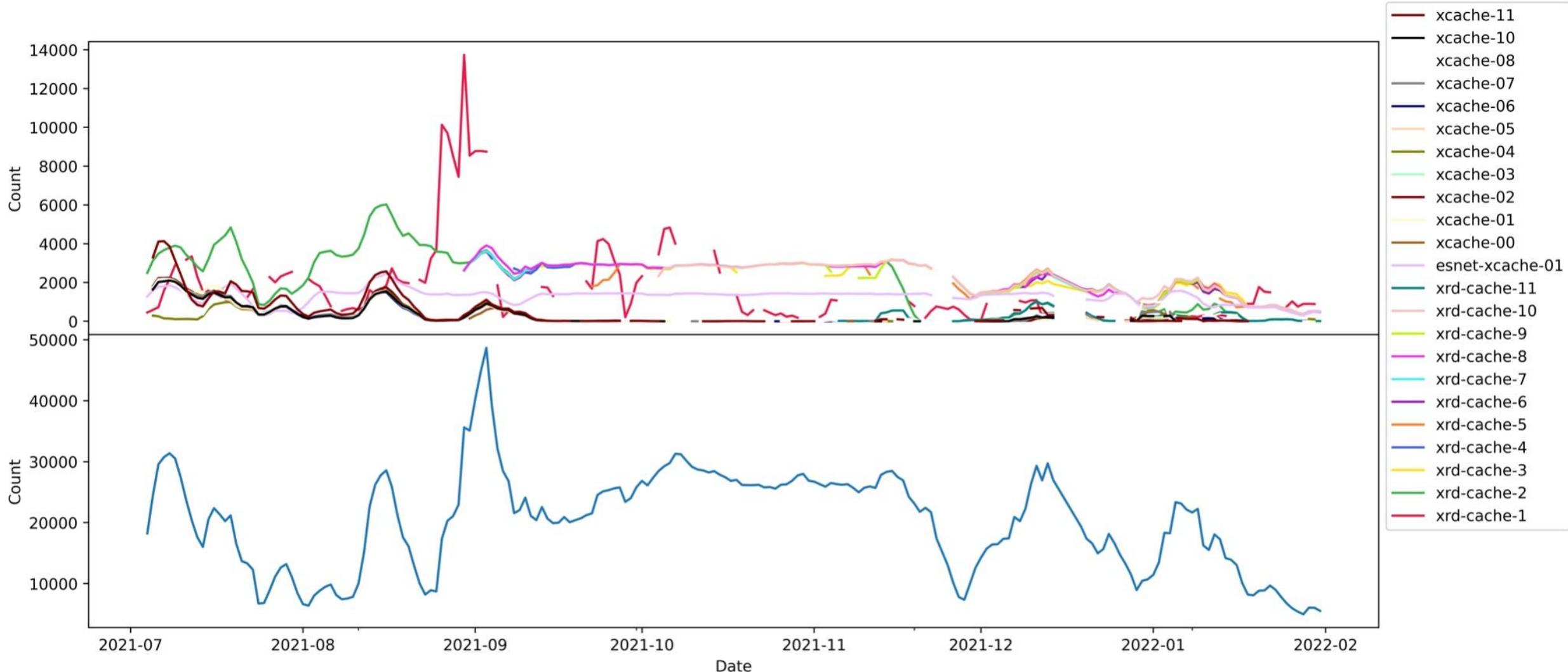




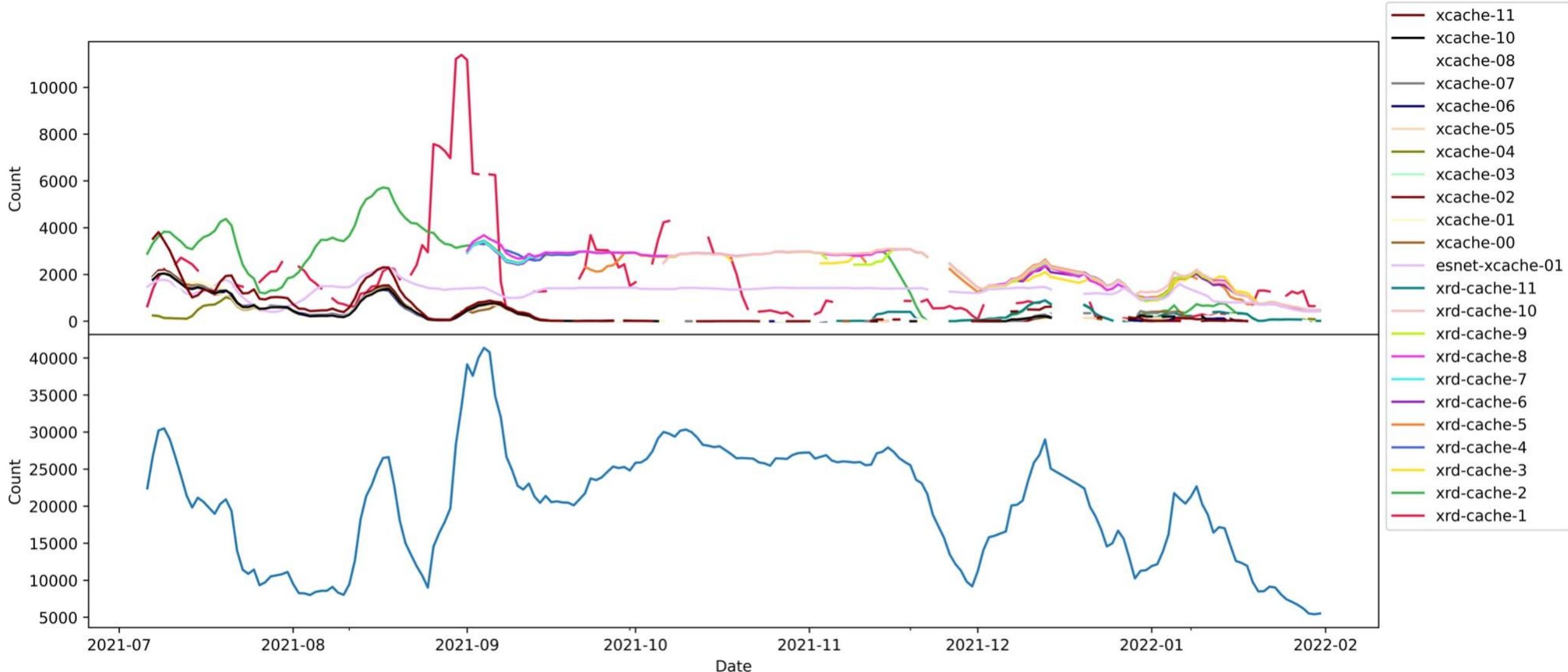
Data re-use counts with moving average 3 days



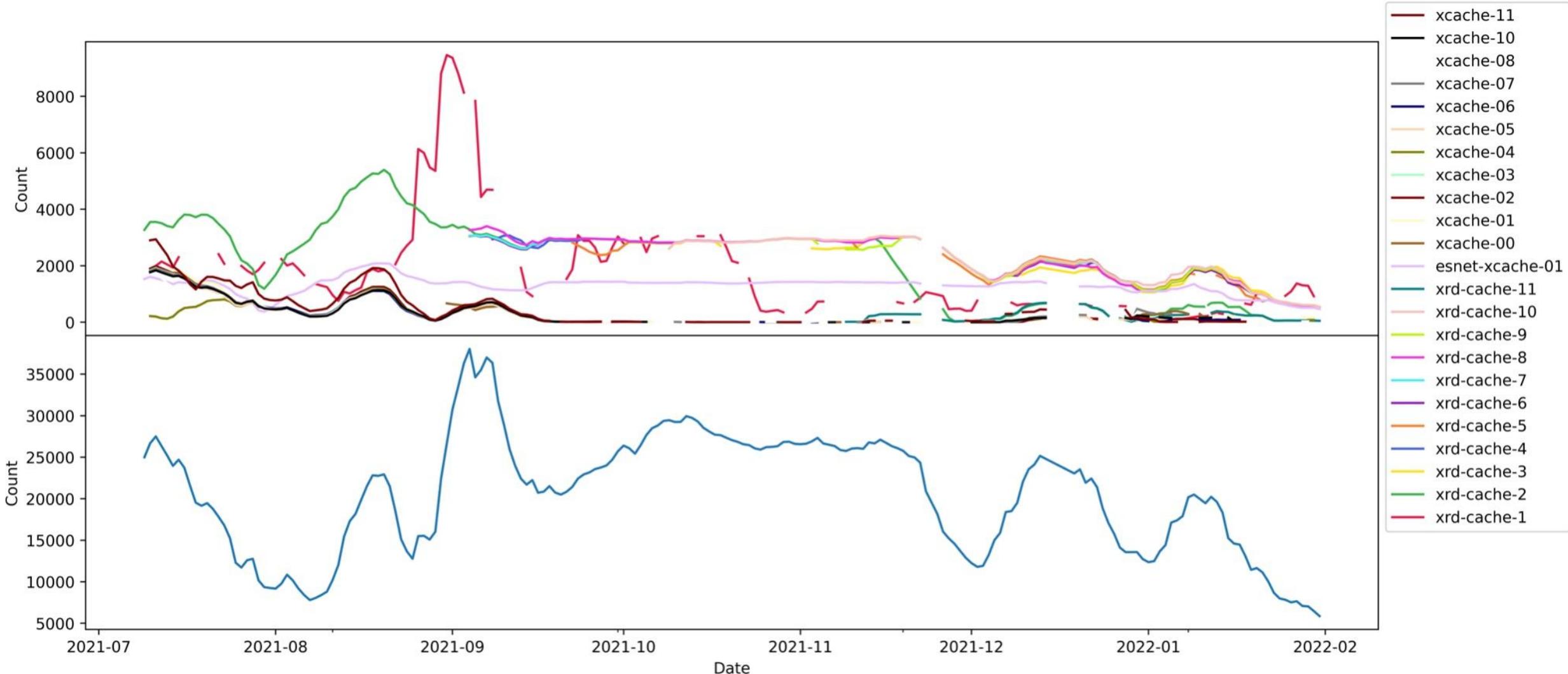
Data re-use counts with moving average 5 days



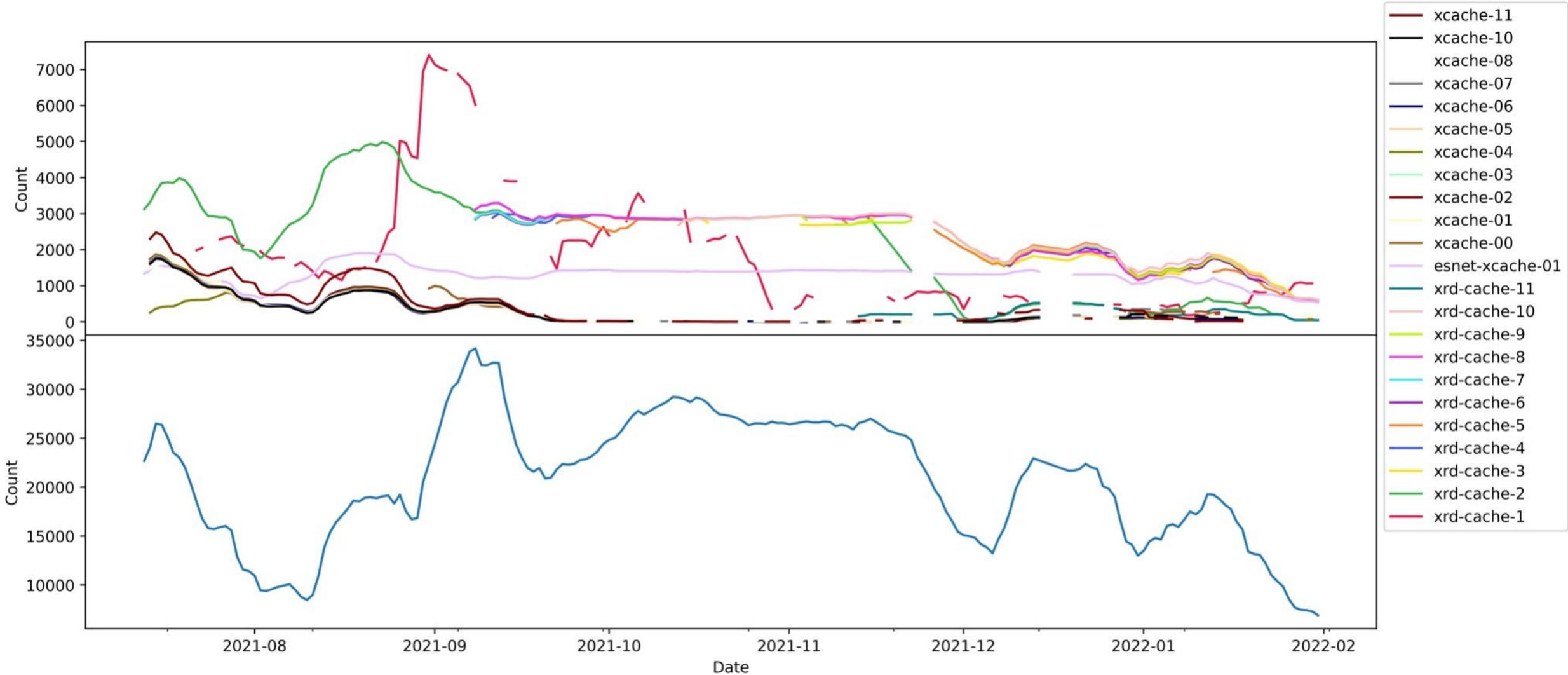
Data re-use counts with moving average 7 days



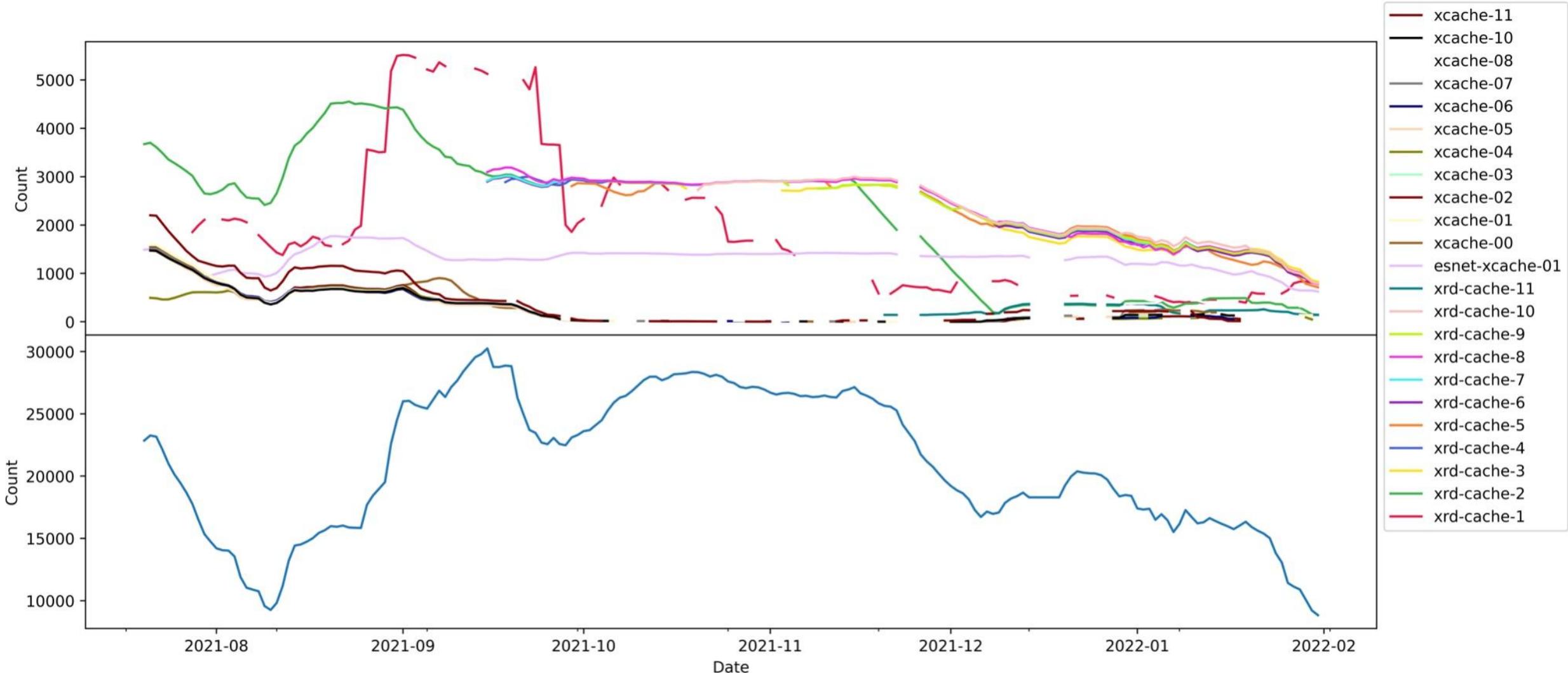
Data re-use counts with moving average 10 days



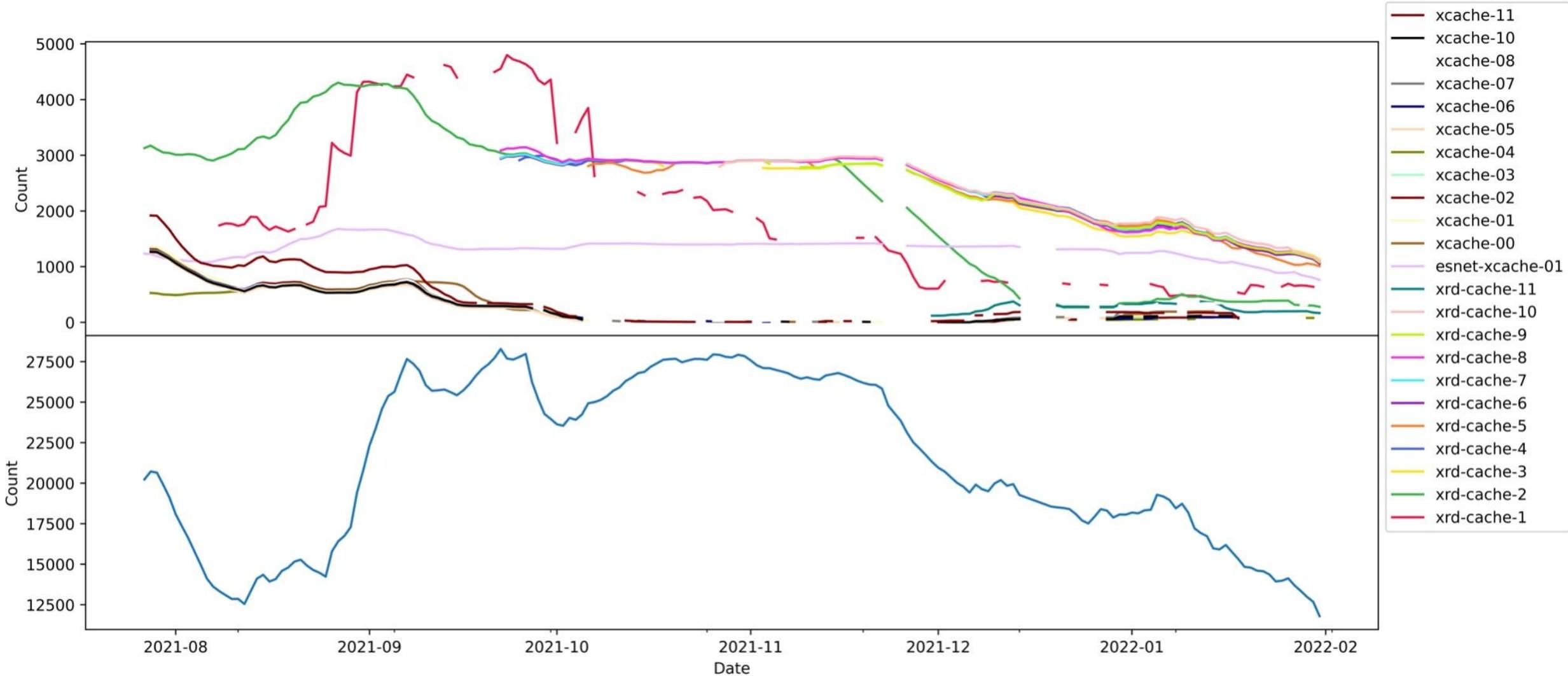
Data re-use counts with moving average 14 days



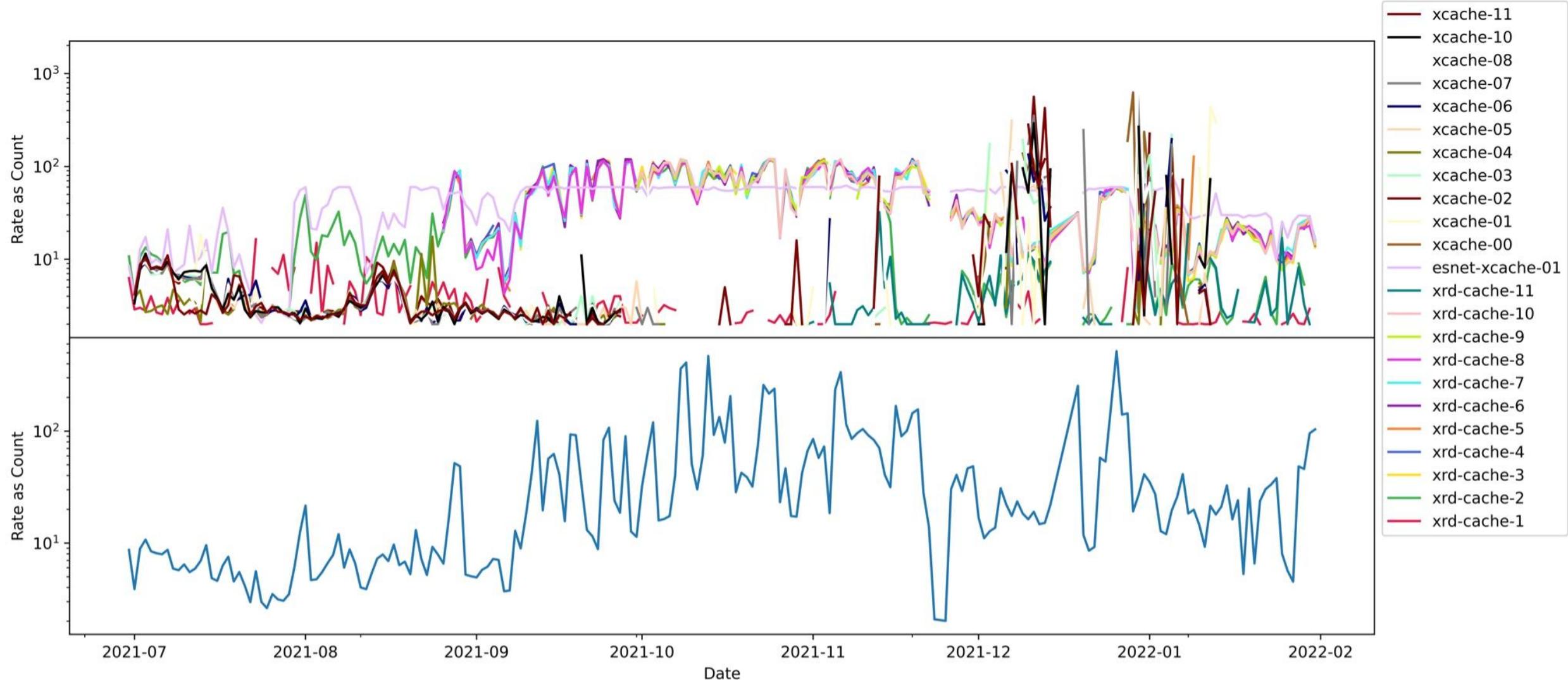
Data re-use counts with moving average 21 days



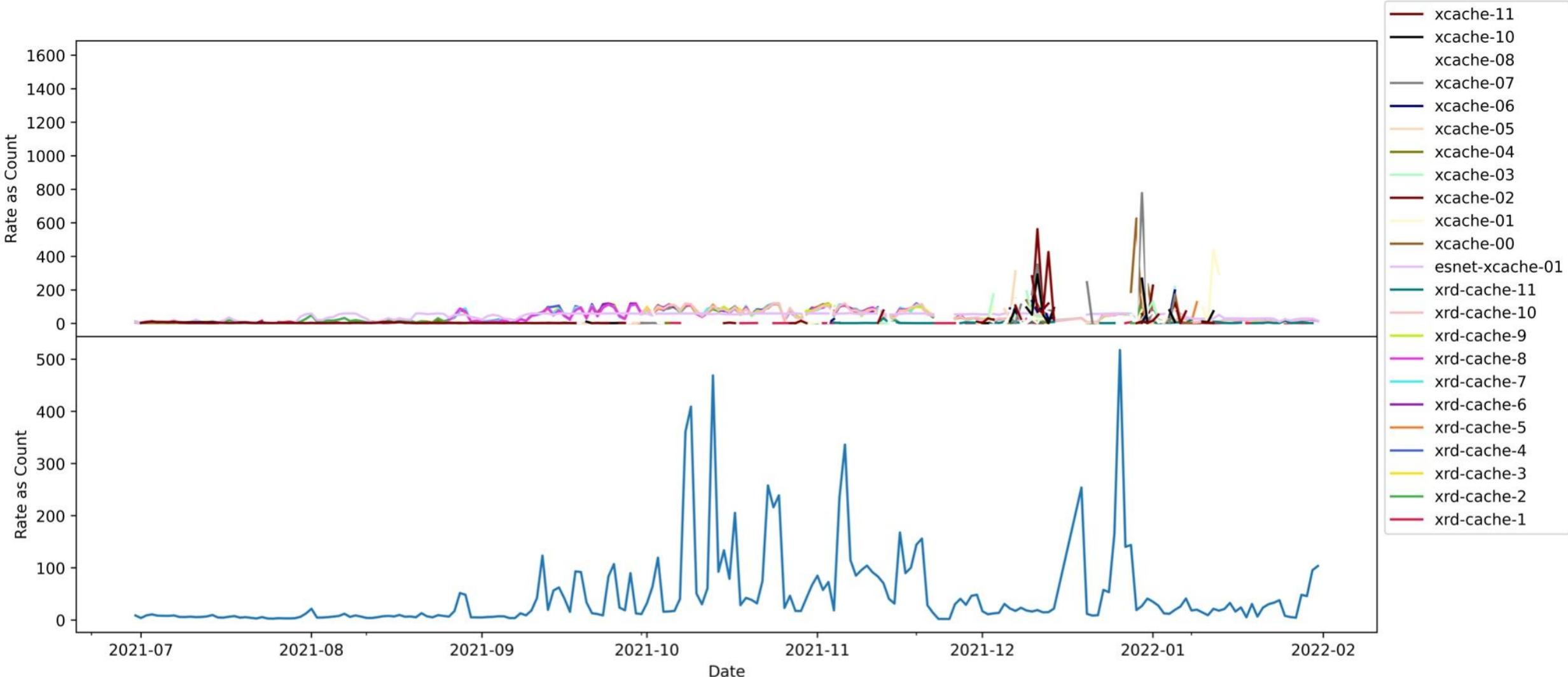
Data re-use counts with moving average 28 days



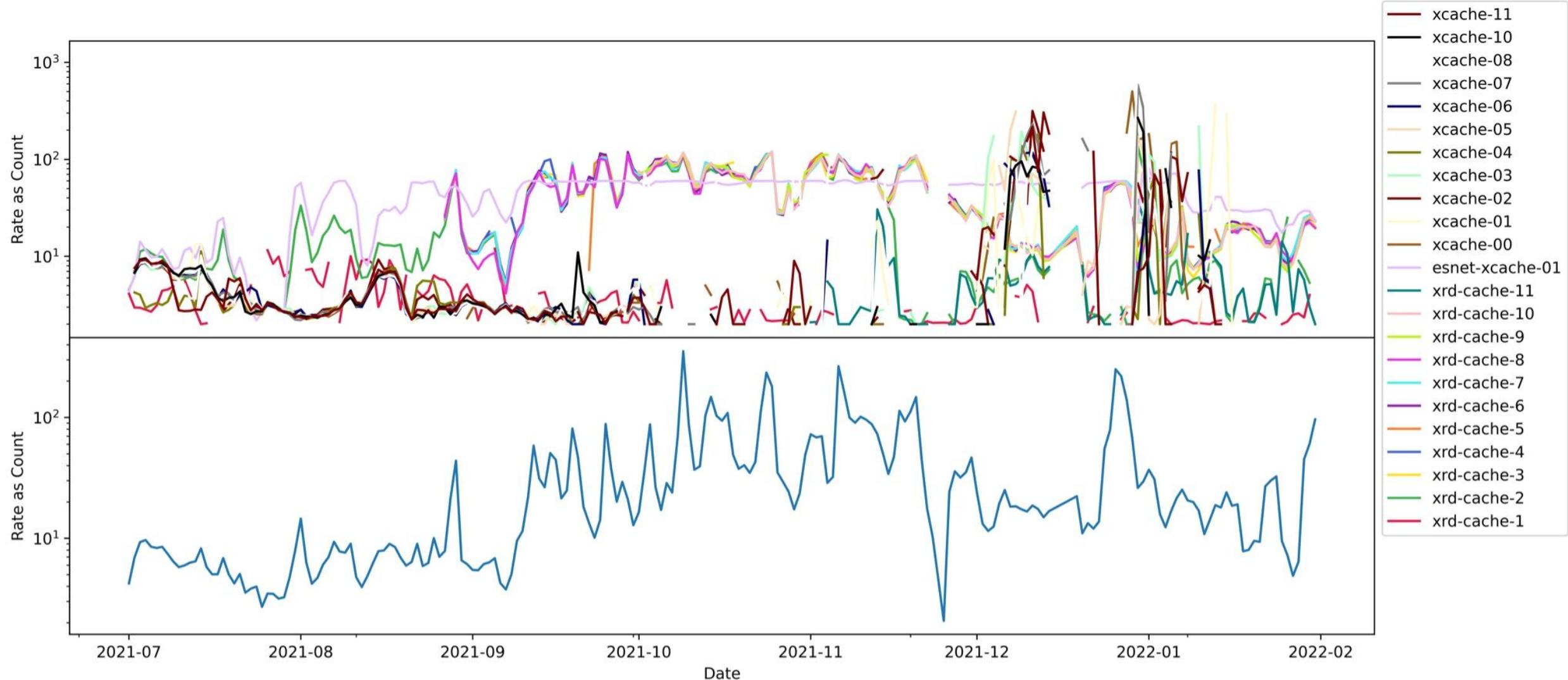
Daily data re-use rates with moving average 1 day (in log scale)



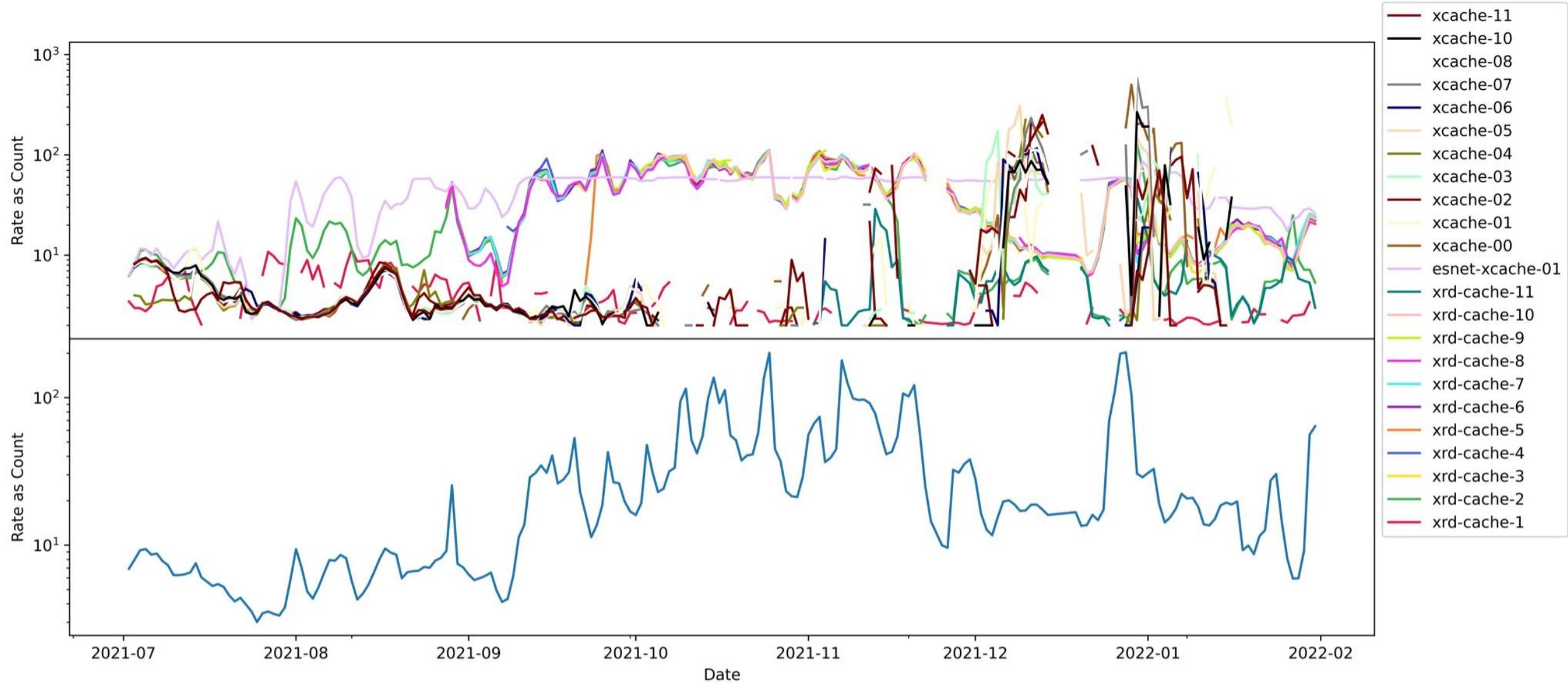
Daily data re-use rates with moving average 1 day (without log scale)



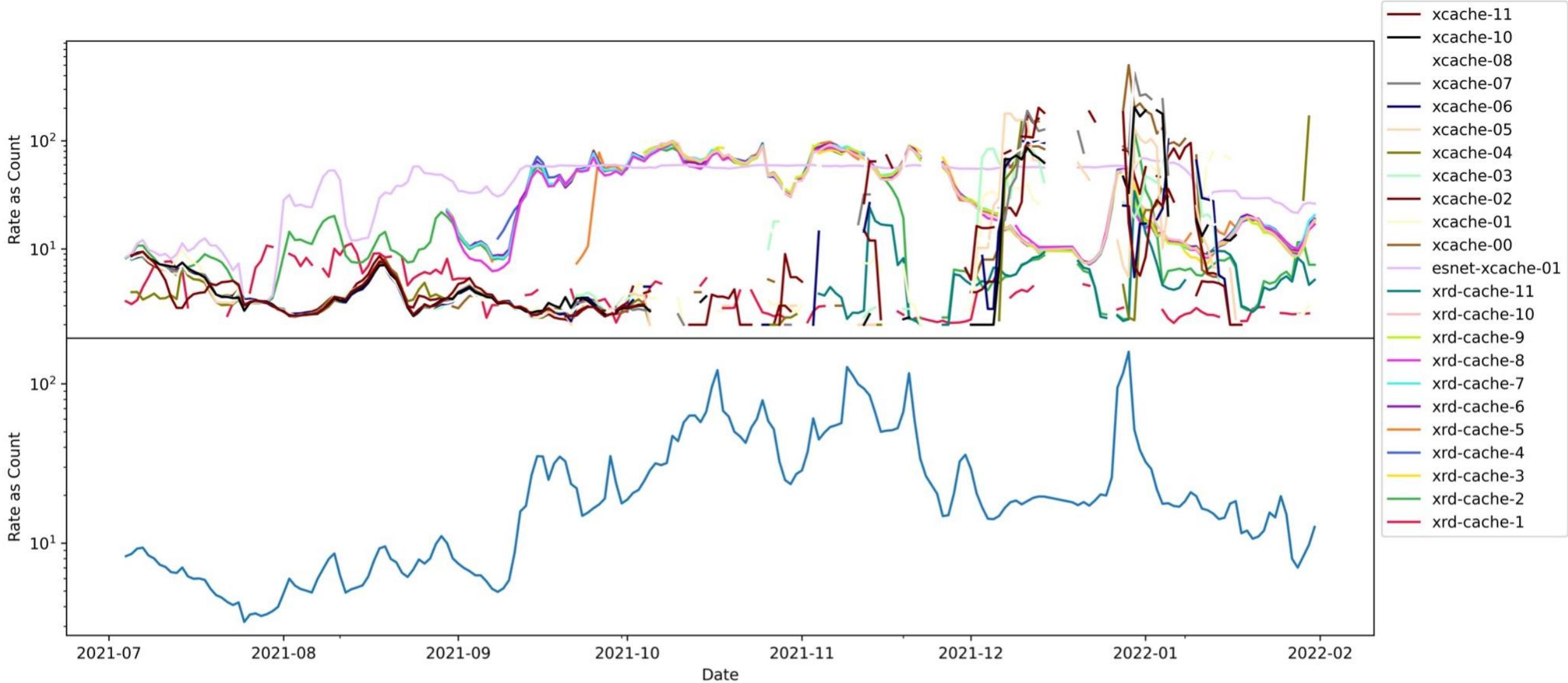
Daily data re-use rates with moving average 2 days (in log scale)



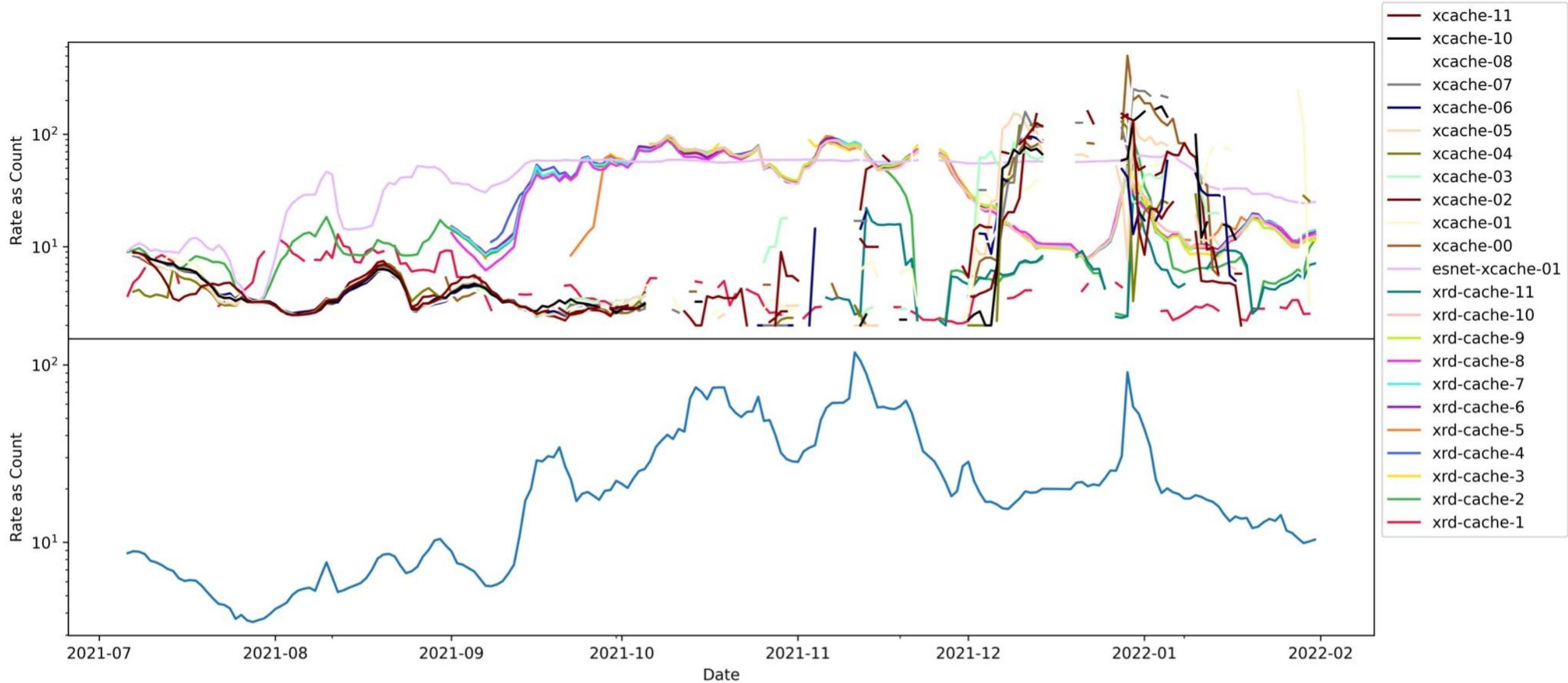
Daily data re-use rates with moving average 3 days (in log scale)



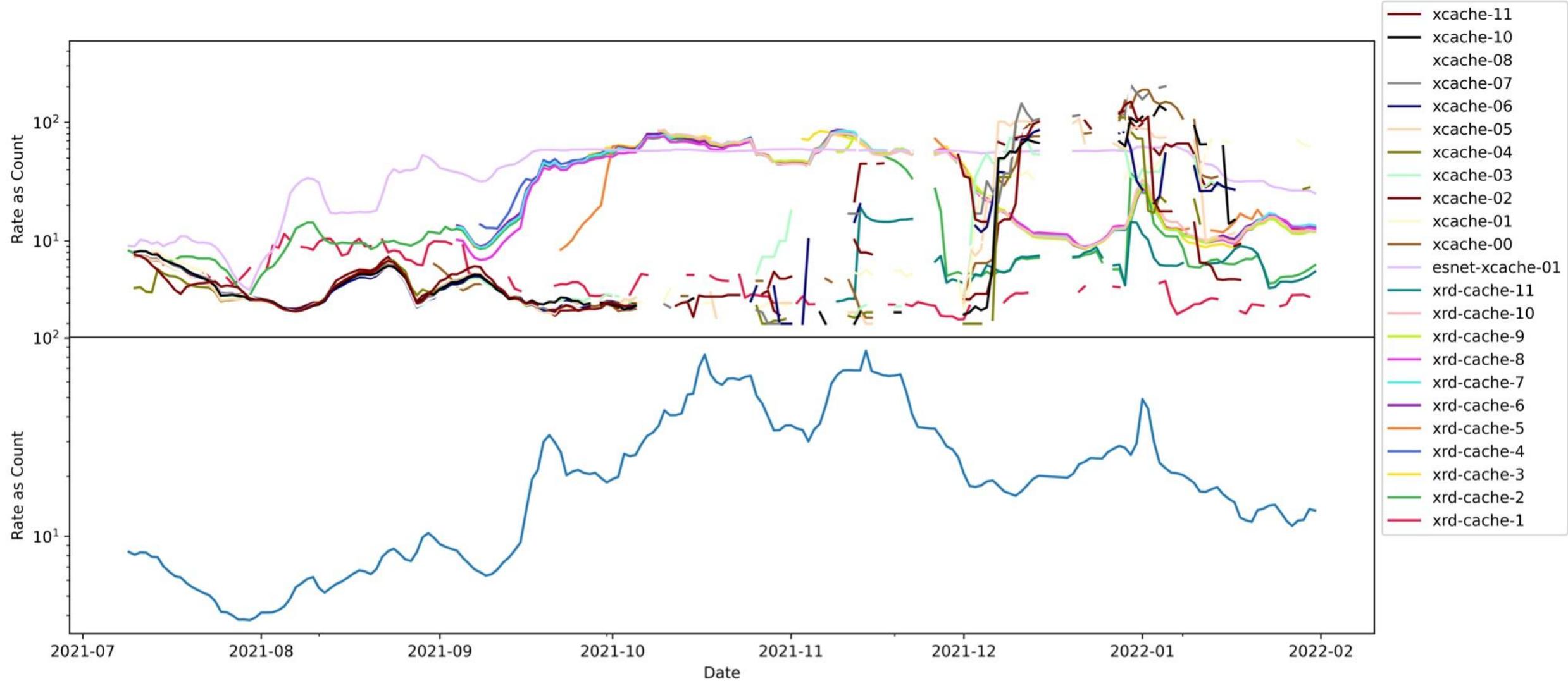
Daily data re-use rates with moving average 5 days (in log scale)



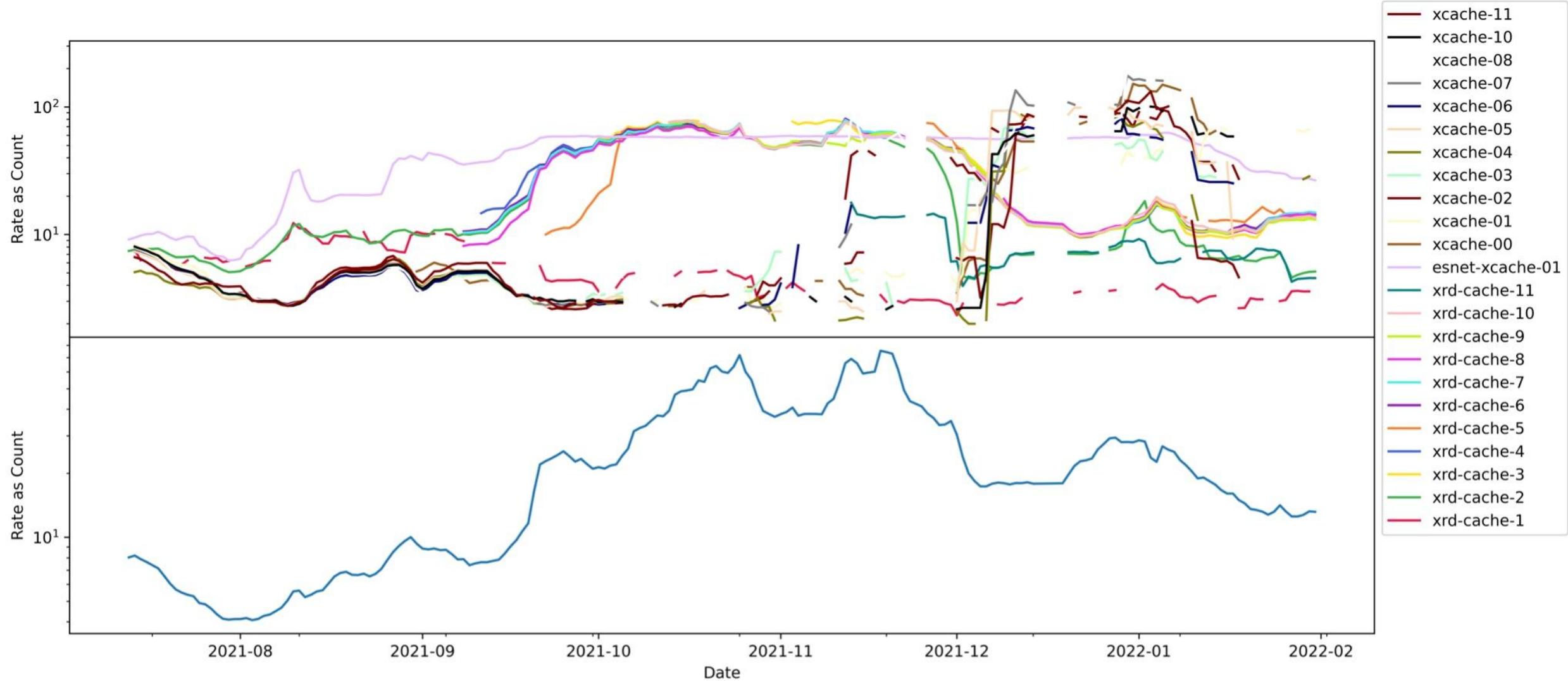
Daily data re-use rates with moving average 7 days (in log scale)



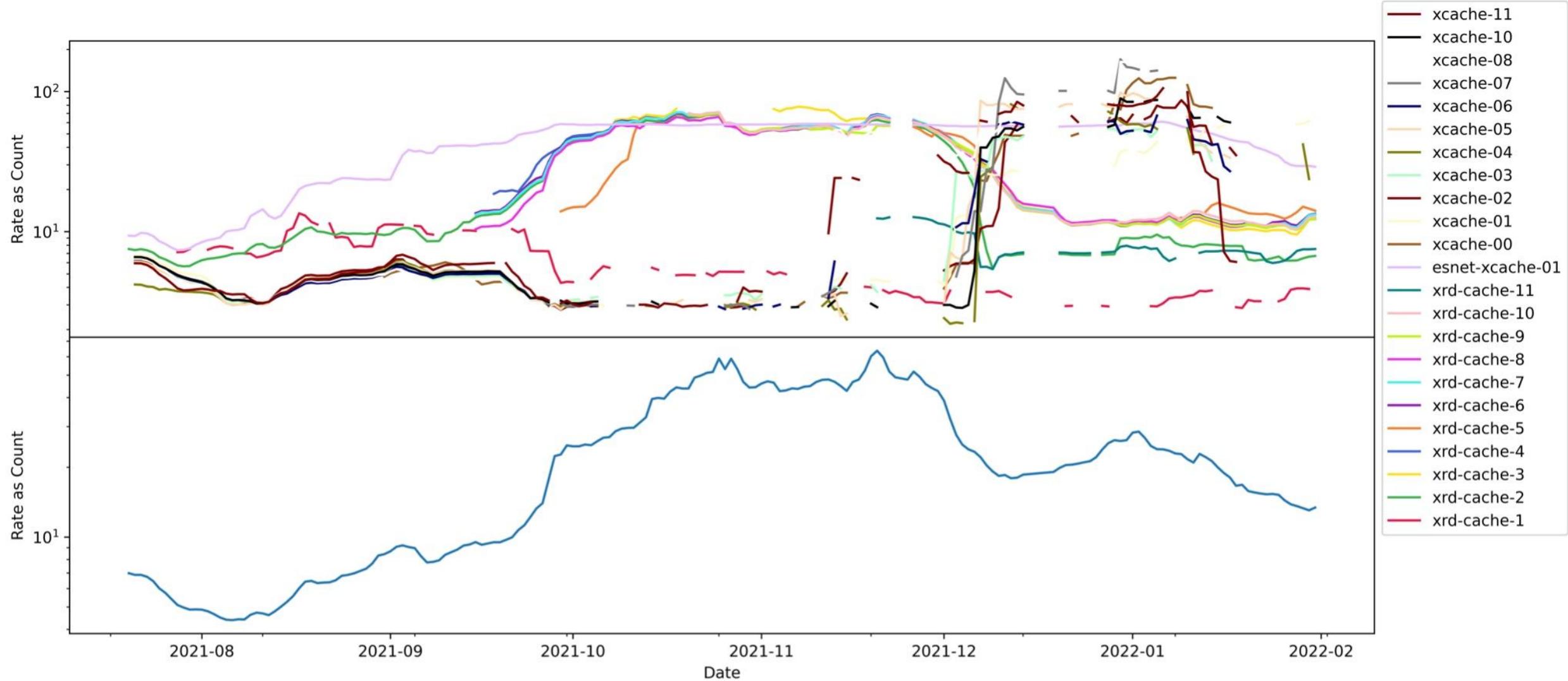
Daily data re-use rates with moving average 10 days (in log scale)



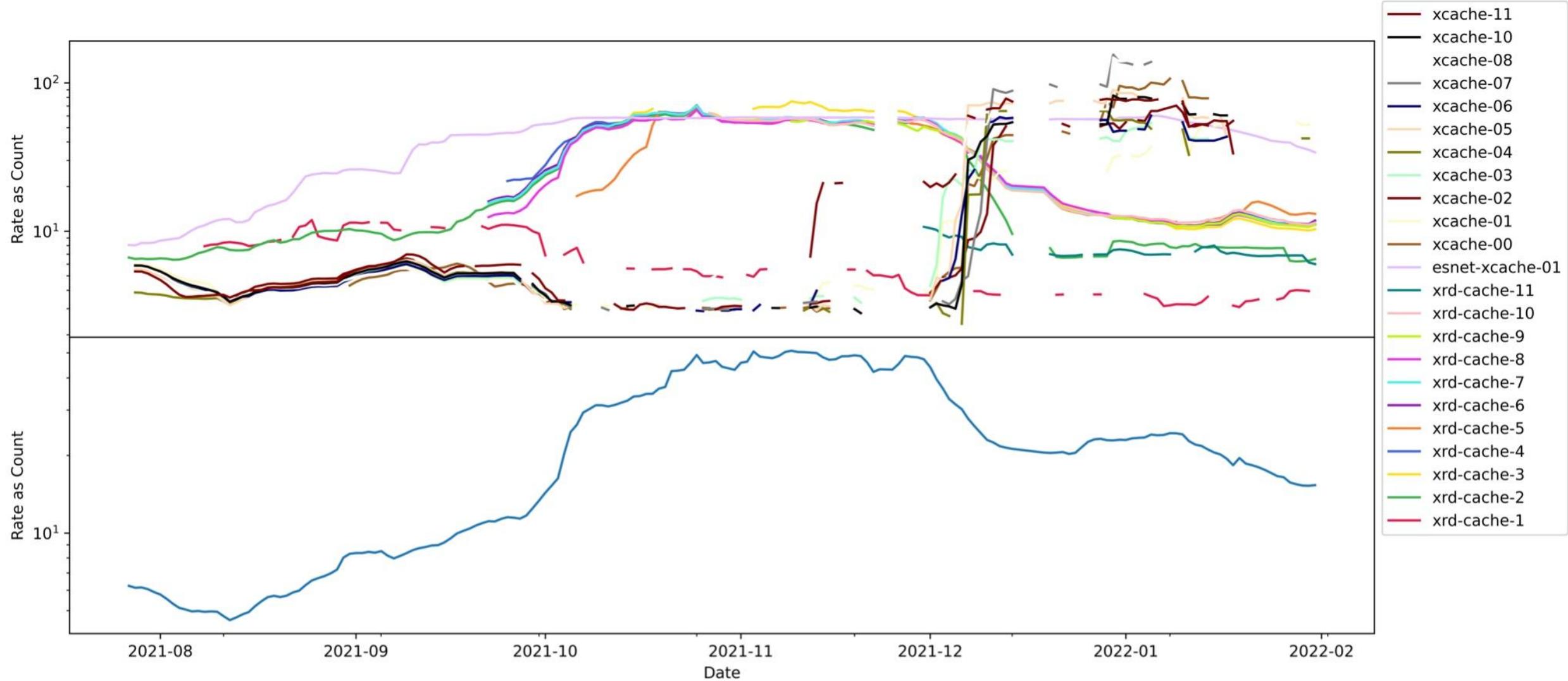
Daily data re-use rates with moving average 14 days (in log scale)



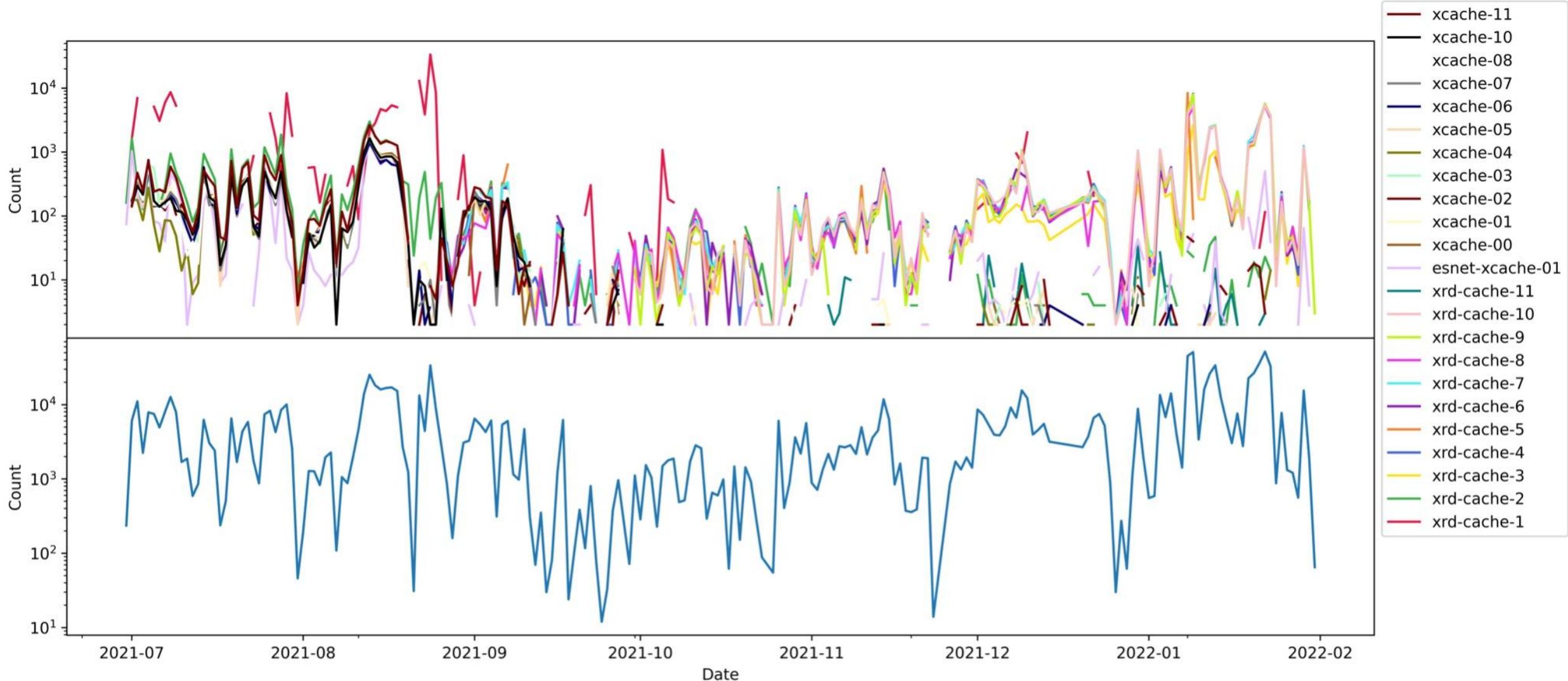
Daily data re-use rates with moving average 21 days (in log scale)



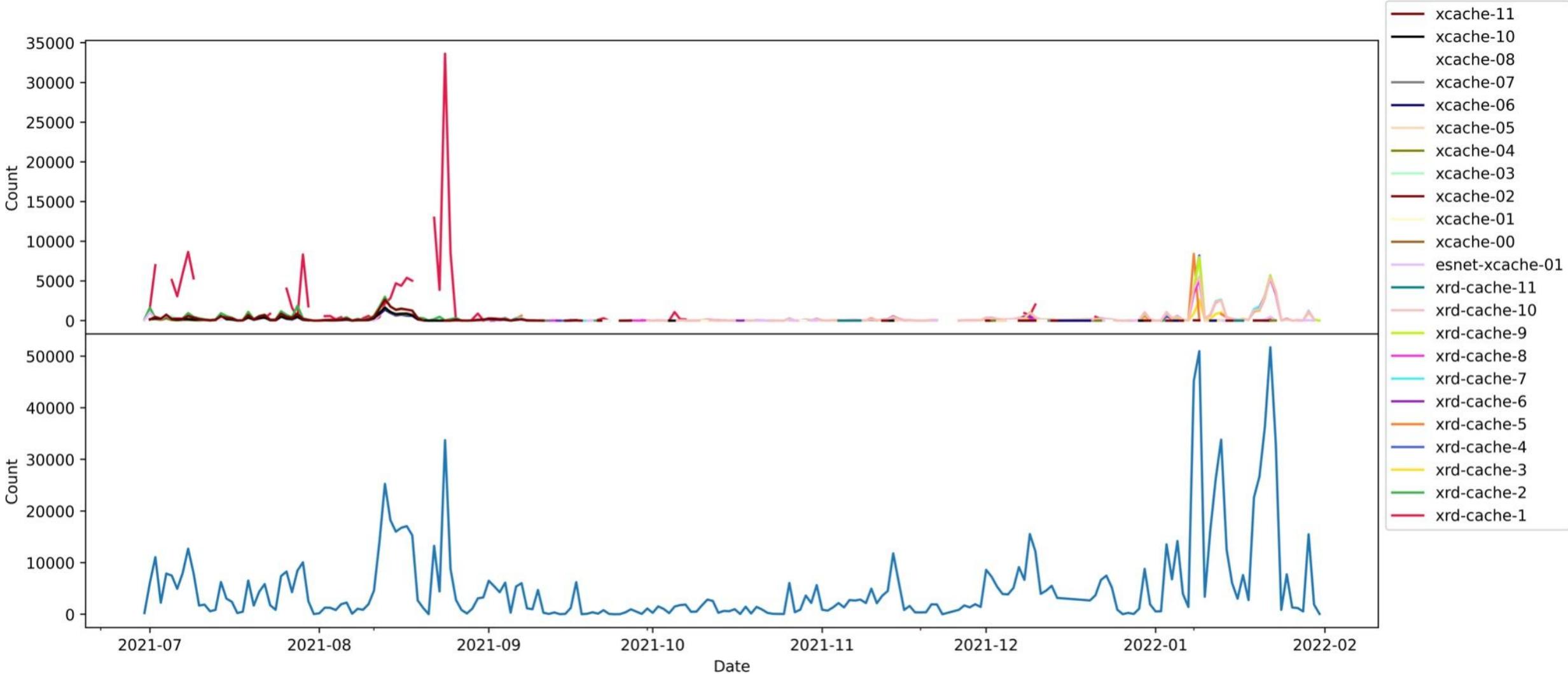
Daily data re-use rates with moving average 28 days (in log scale)



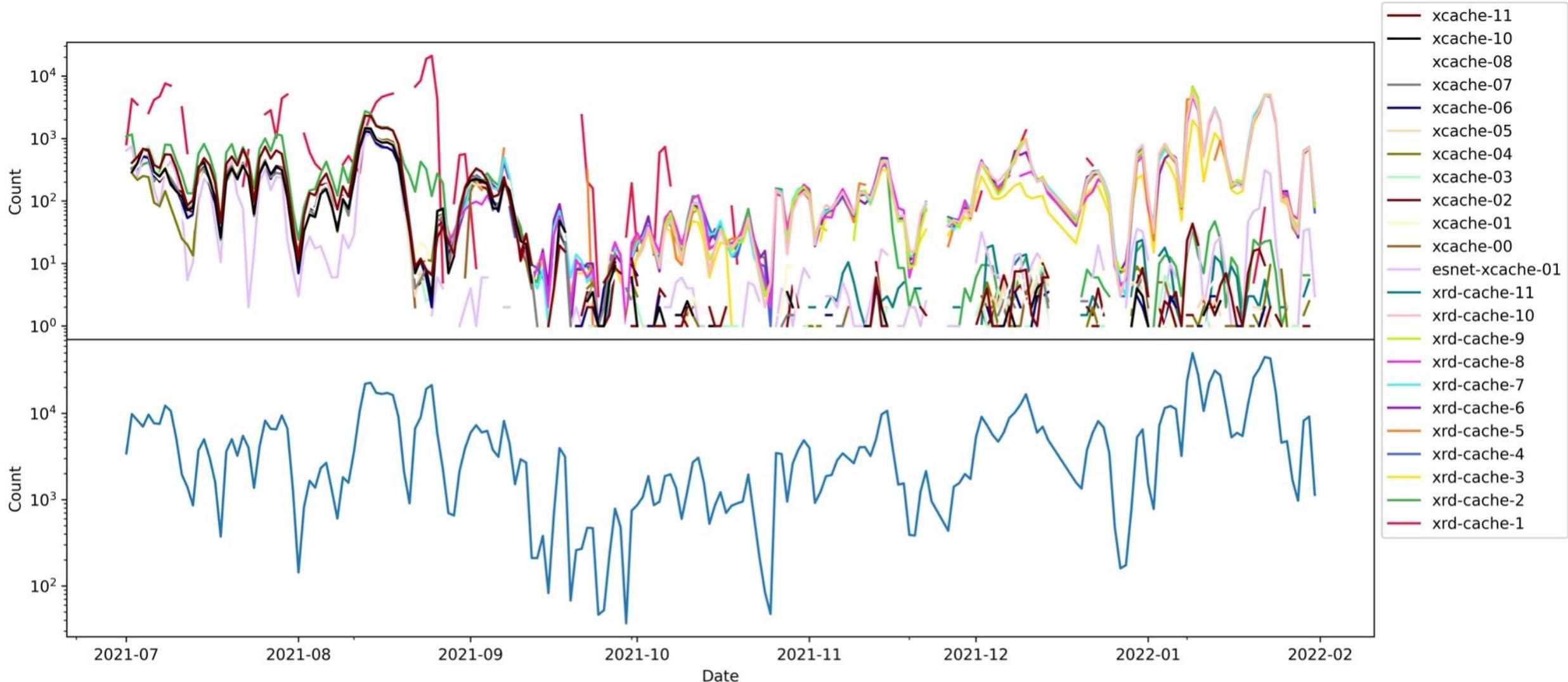
Daily data re-access counts with moving average 1 day (in log scale)



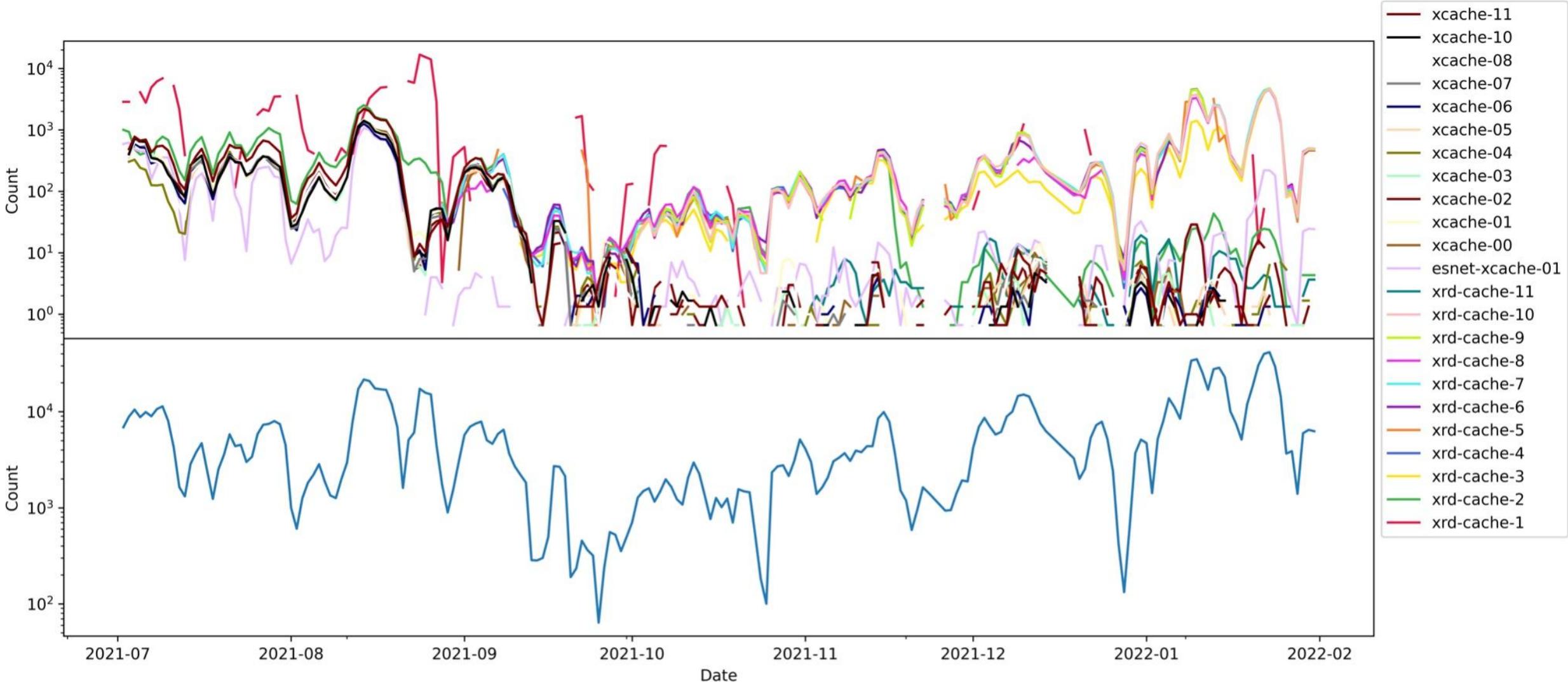
Daily data re-access counts with moving average 1 day (without log scale)



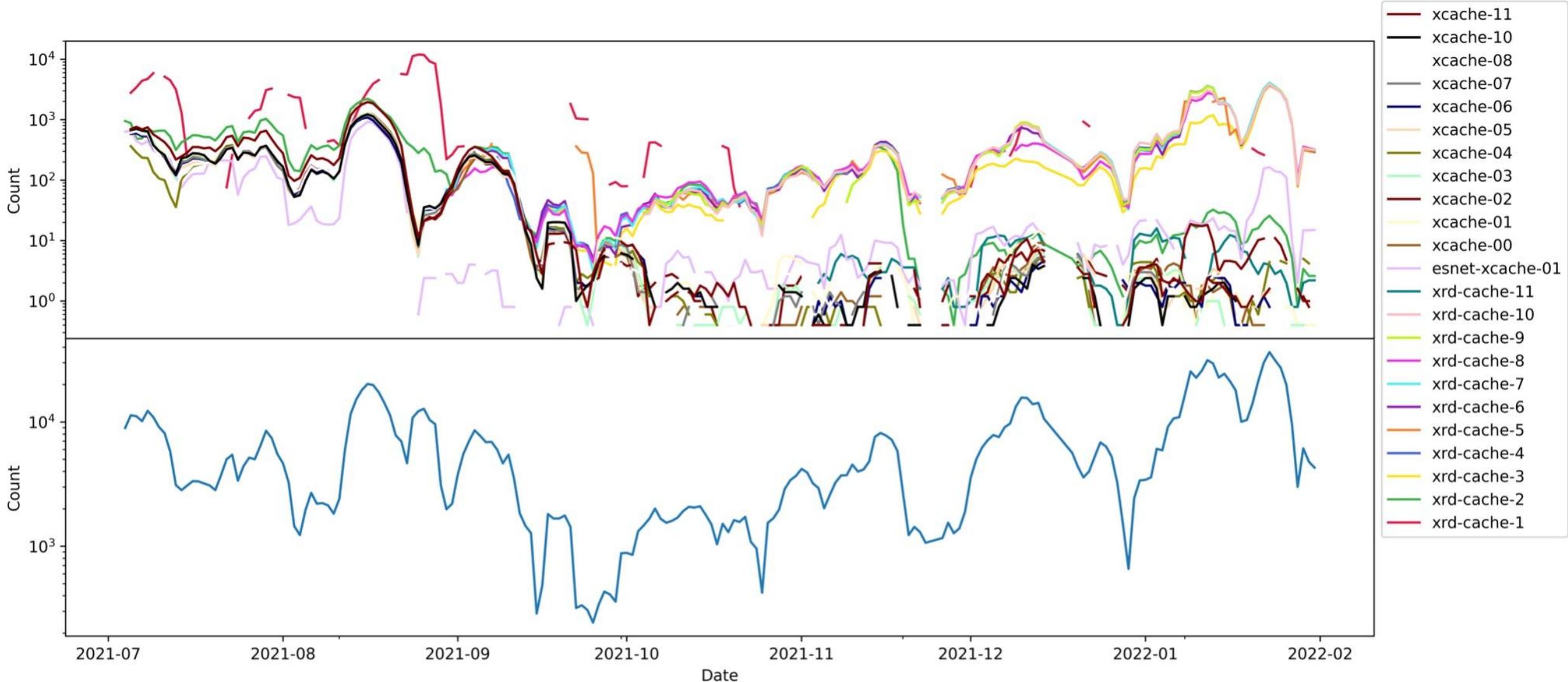
Daily data re-access counts with moving average 2 days (in log scale)



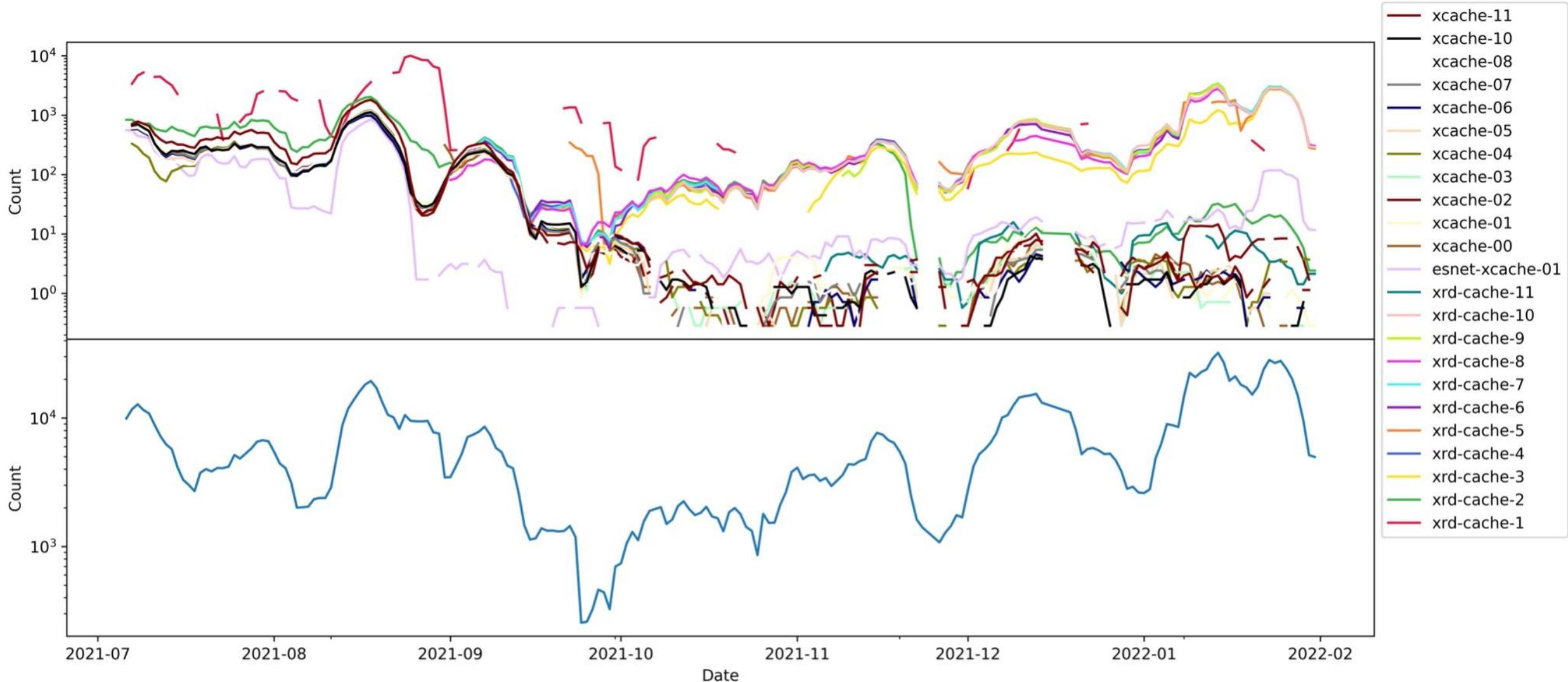
Daily data re-access counts with moving average 3 days (in log scale)



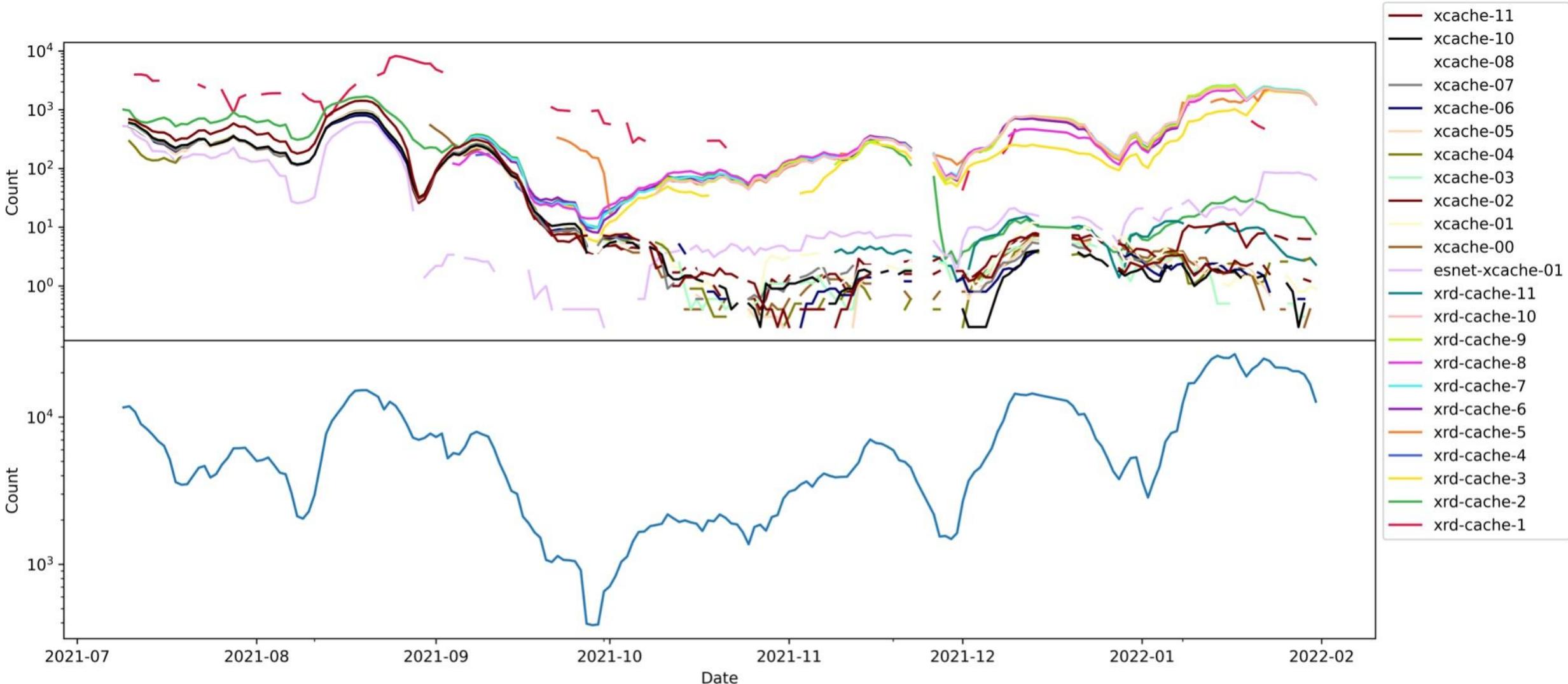
Daily data re-access counts with moving average 5 days (in log scale)



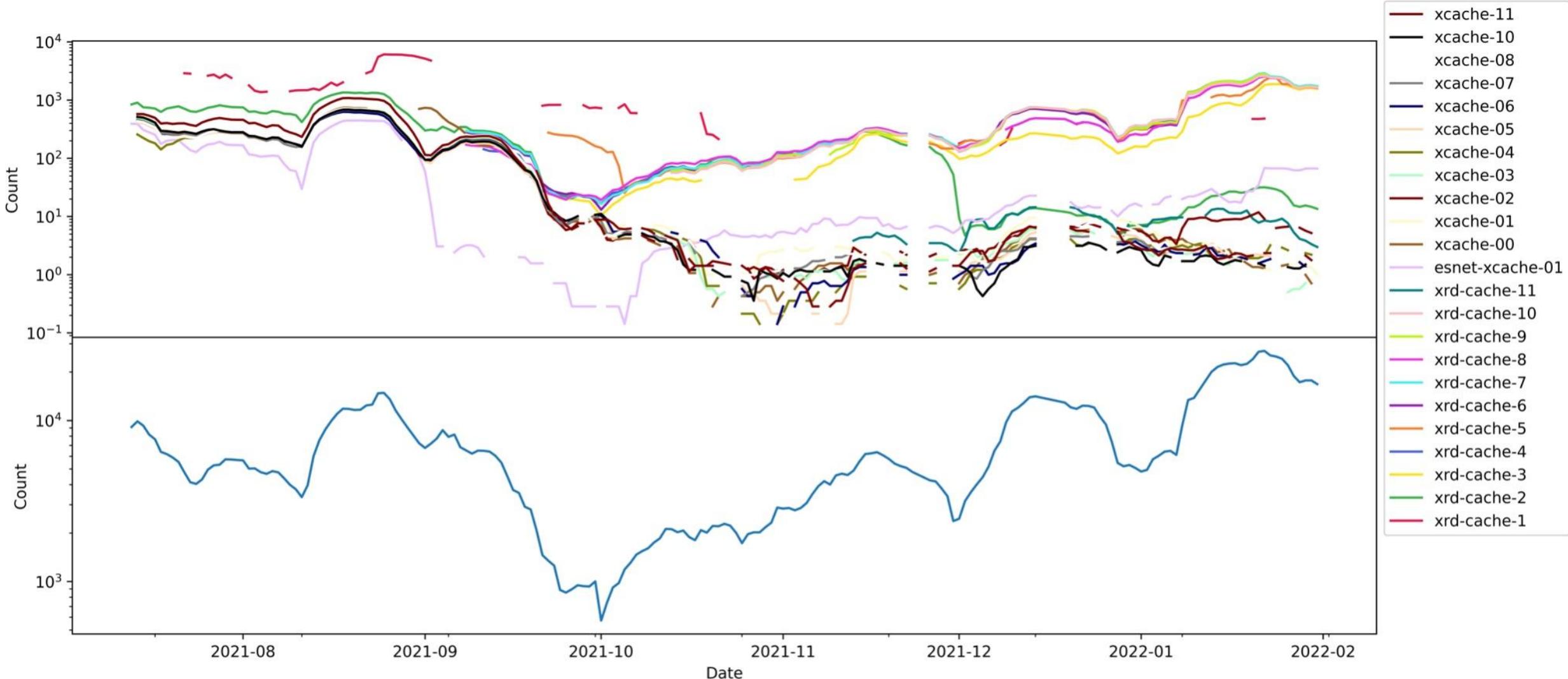
Daily data re-access counts with moving average 7 days (in log scale)



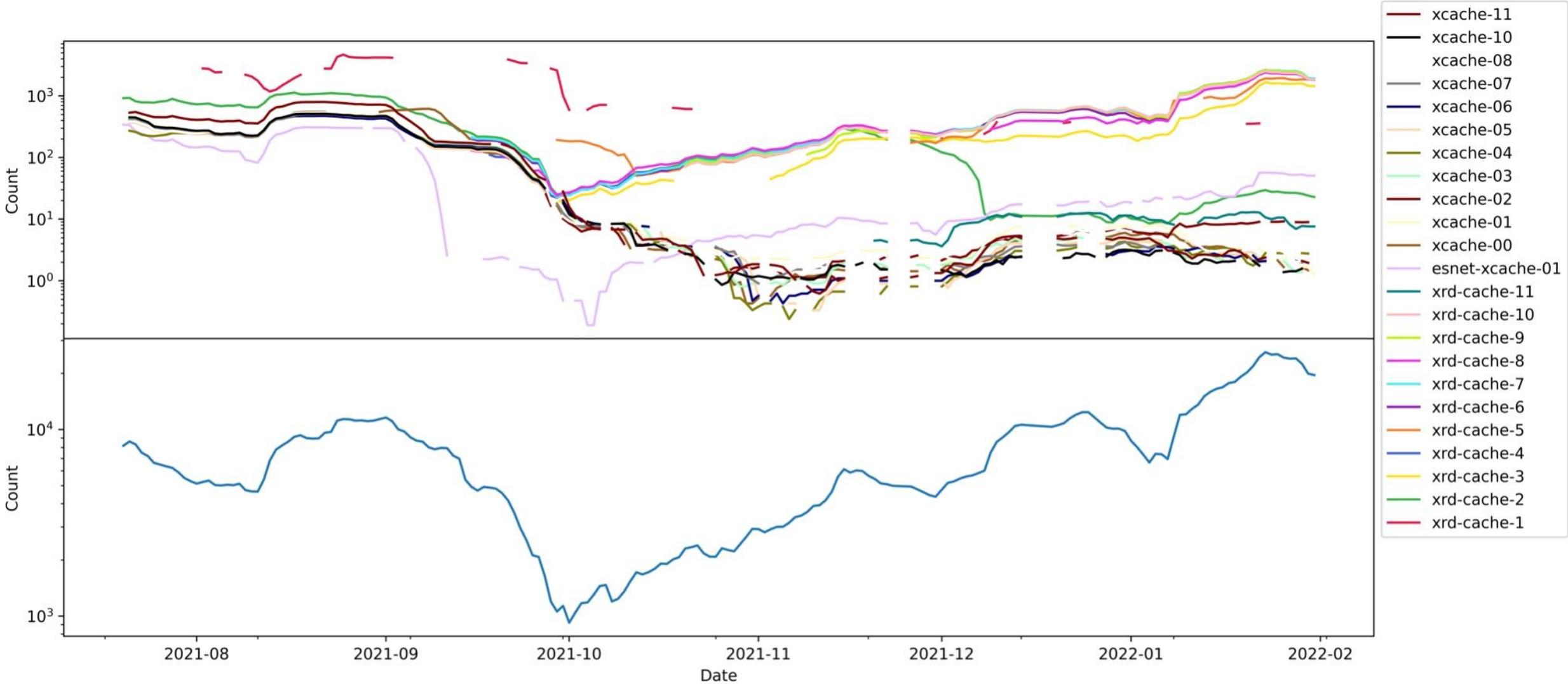
Daily data re-access counts with moving average 10 days (in log scale)



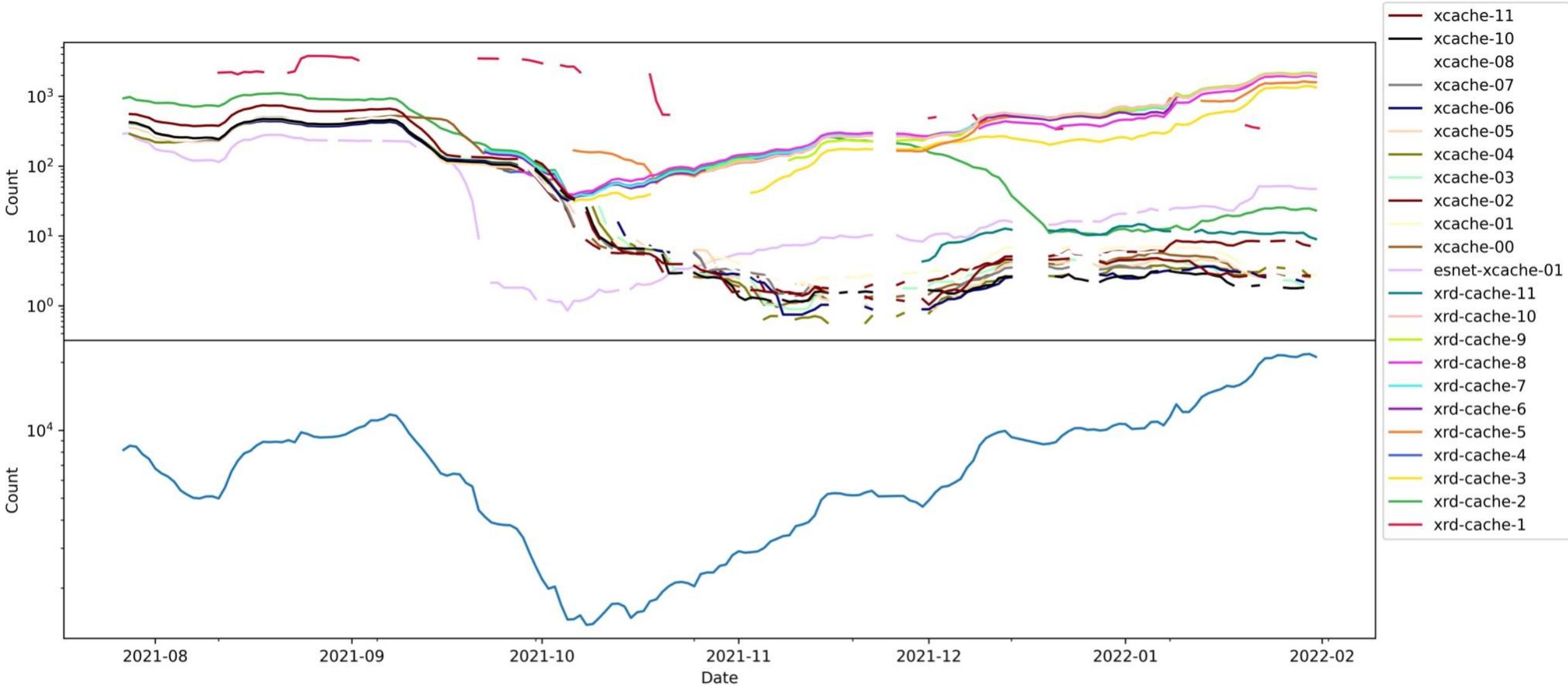
Daily data re-access counts with moving average 14 days (in log scale)



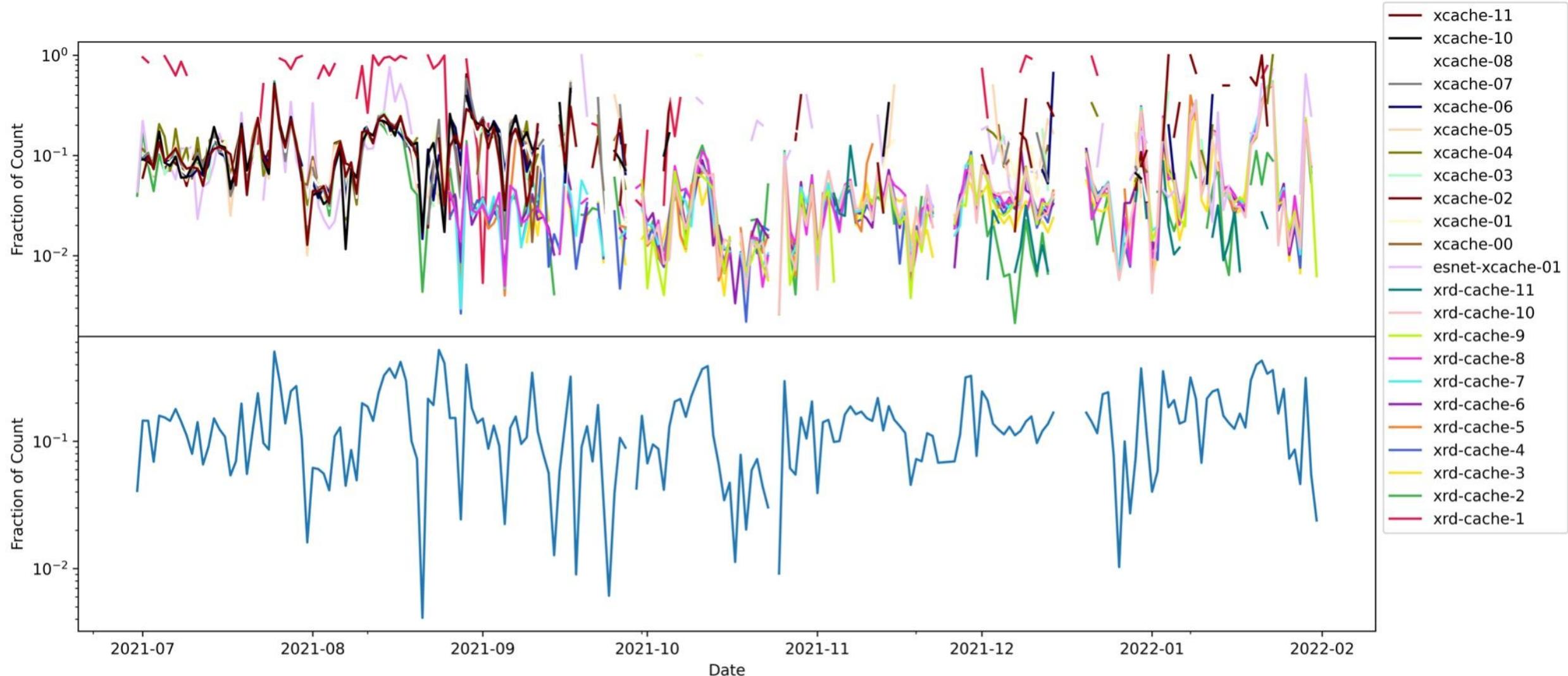
Daily data re-access counts with moving average 21 days (in log scale)



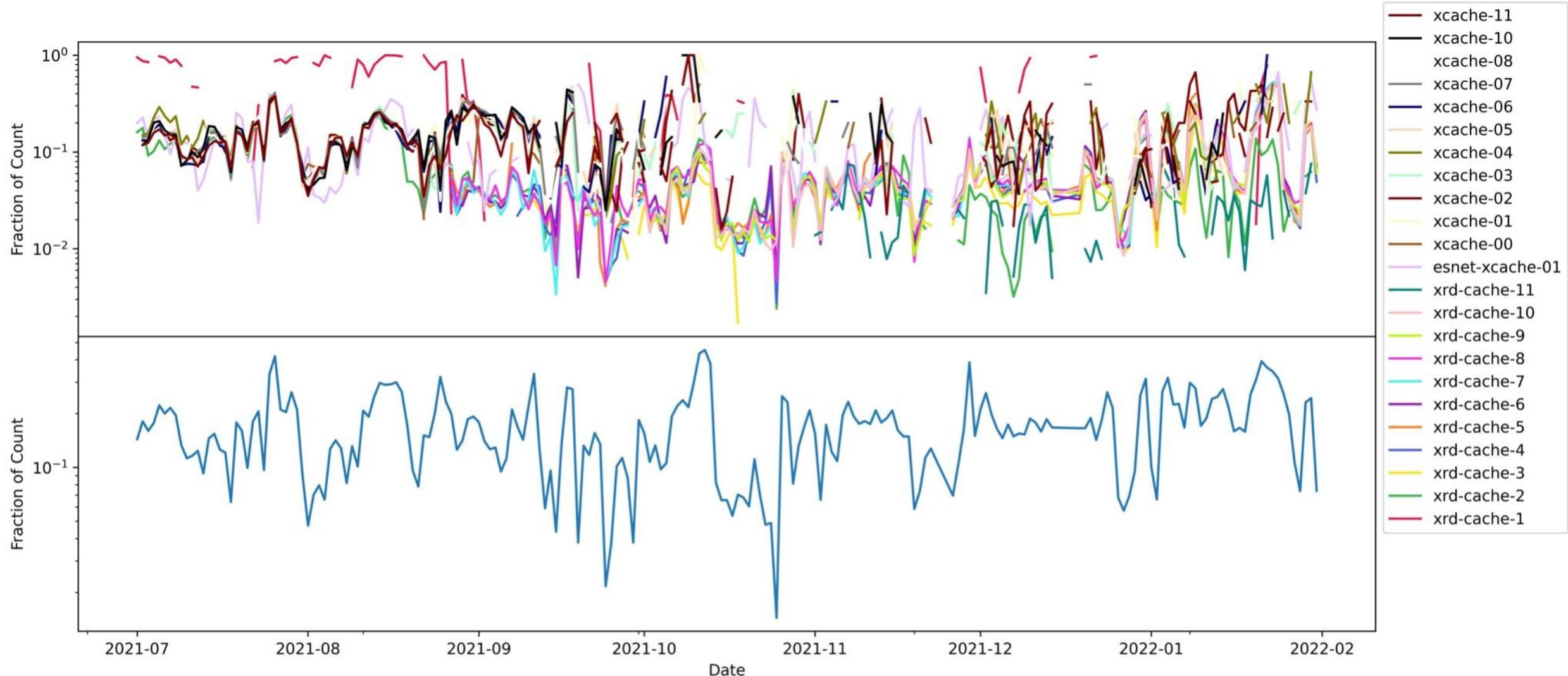
Daily data re-access counts with moving average 28 days (in log scale)



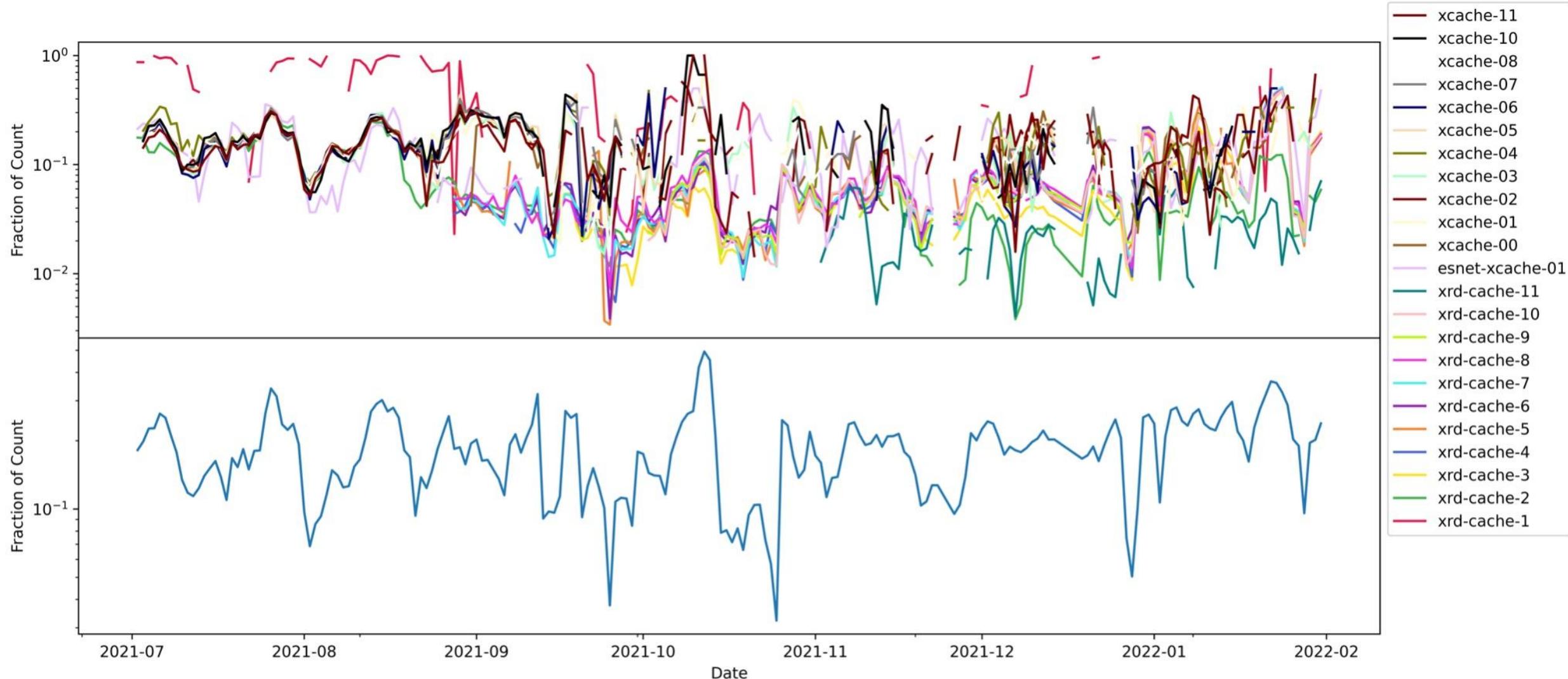
Daily data re-access fraction with moving average 1 day (in log scale)



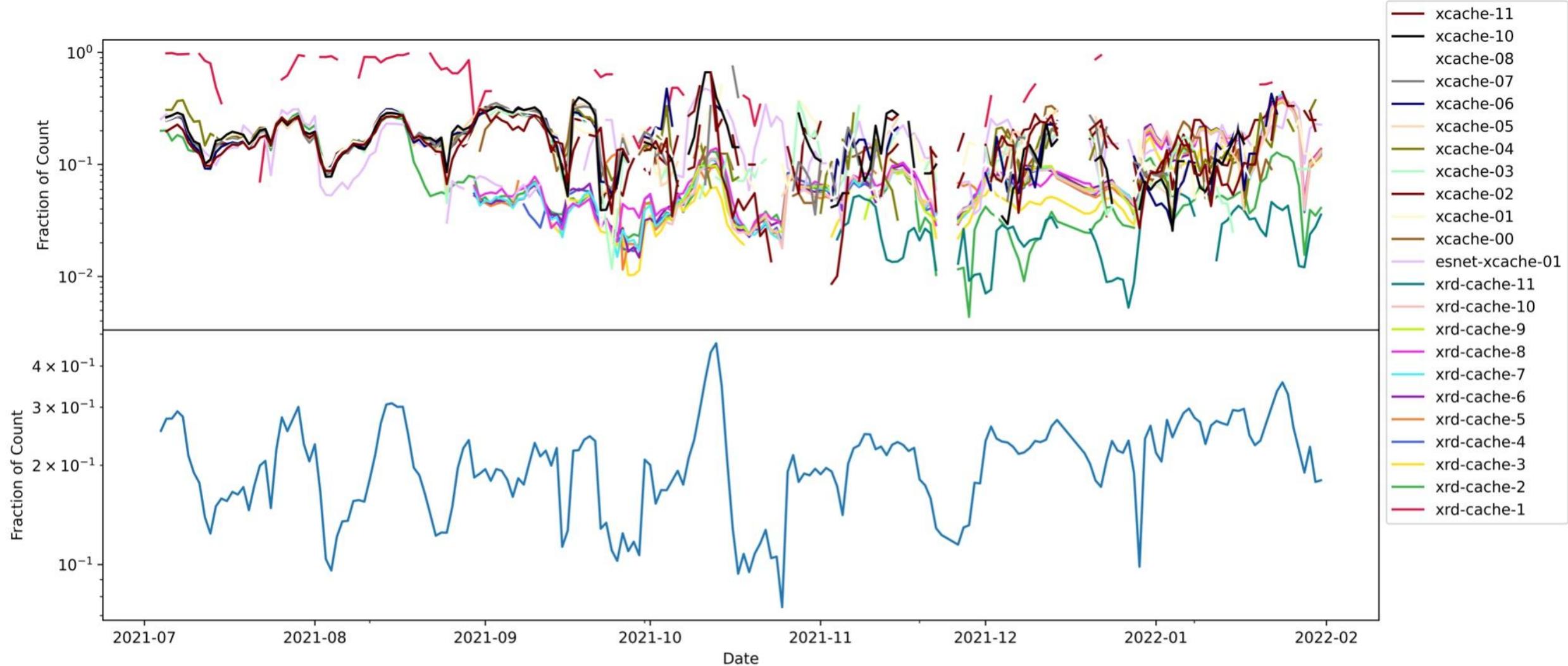
Daily data re-access fraction with moving average 2 days (in log scale)



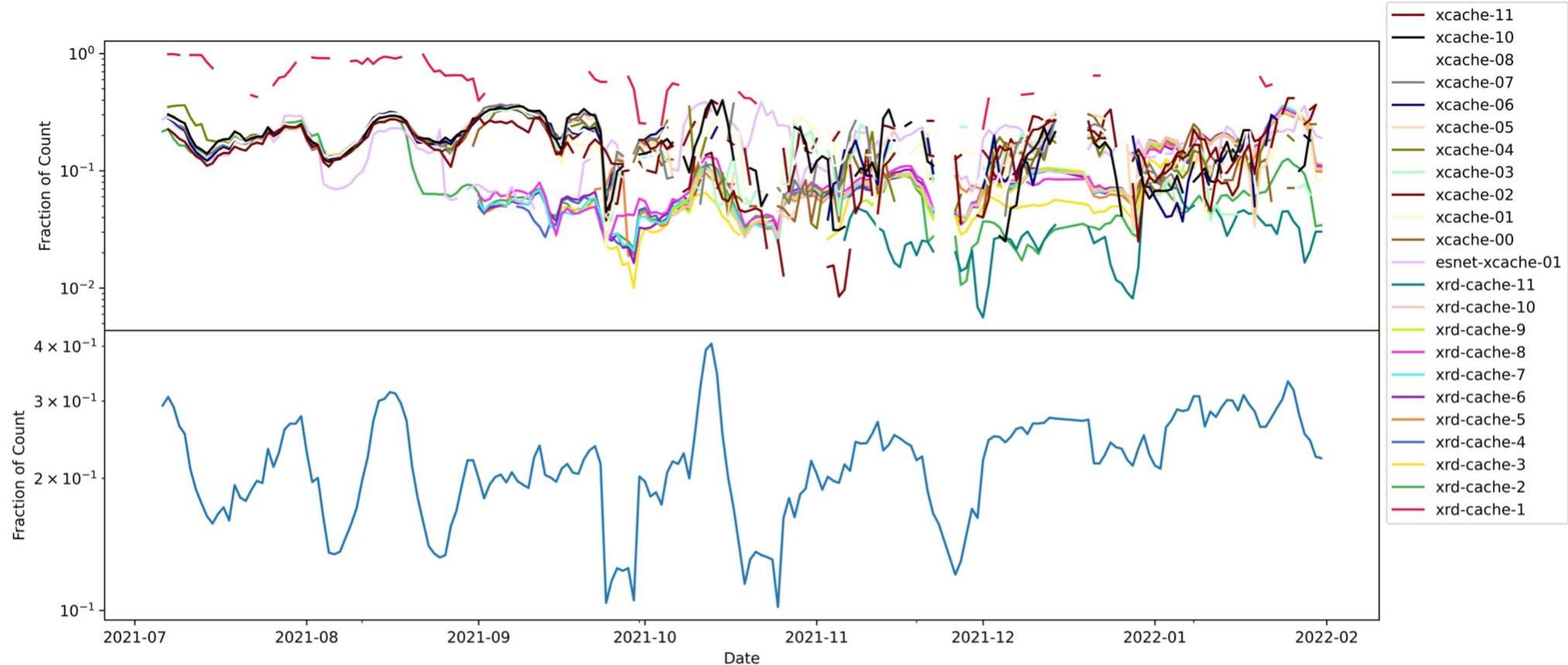
Daily data re-access fraction with moving average 3 days (in log scale)



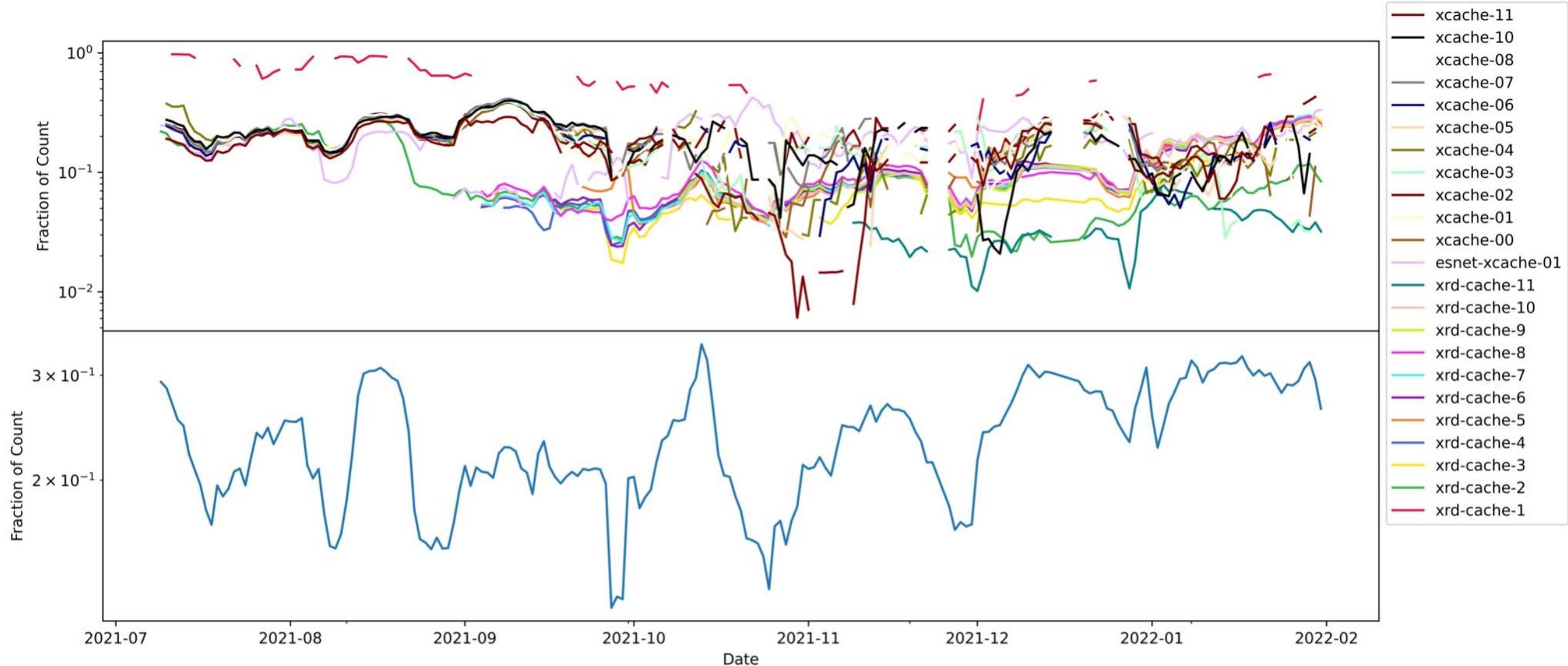
Daily data re-access fraction with moving average 5 days (in log scale)



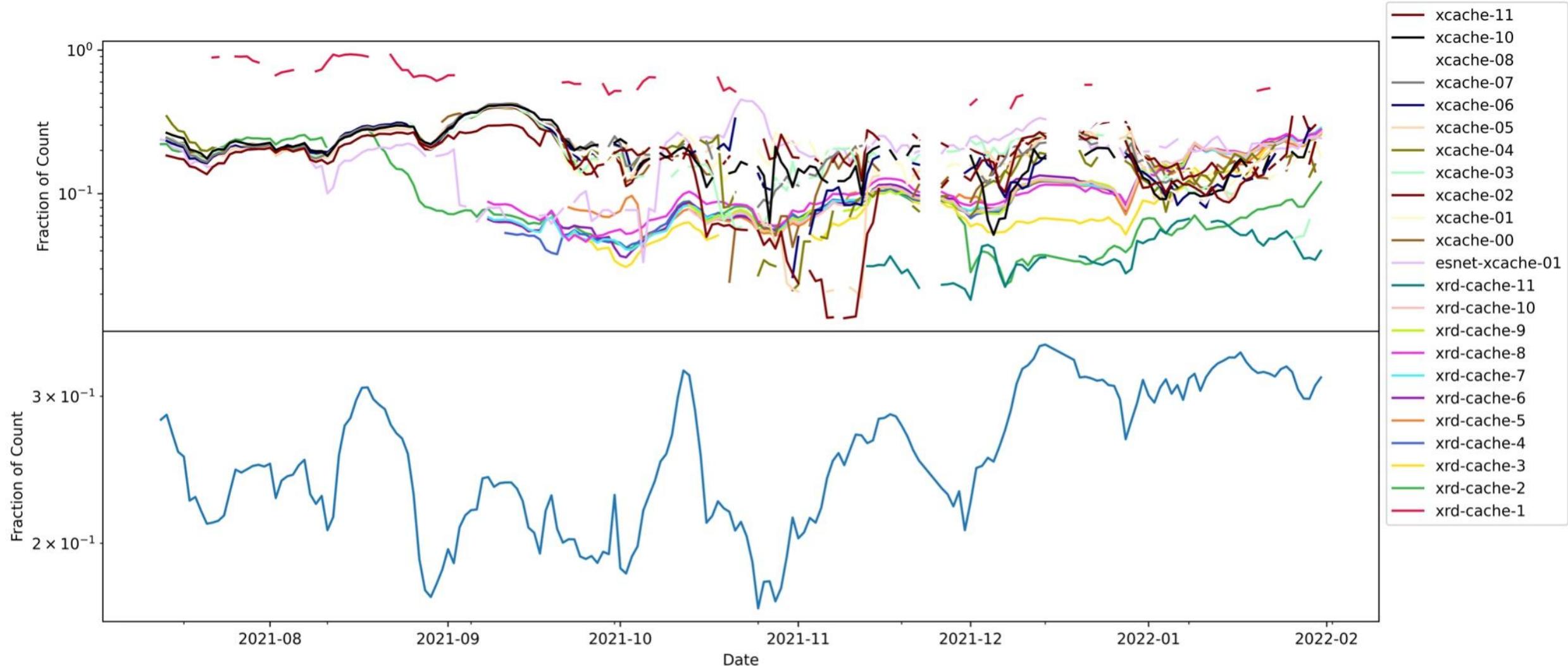
Daily data re-access fraction with moving average 7 days (in log scale)



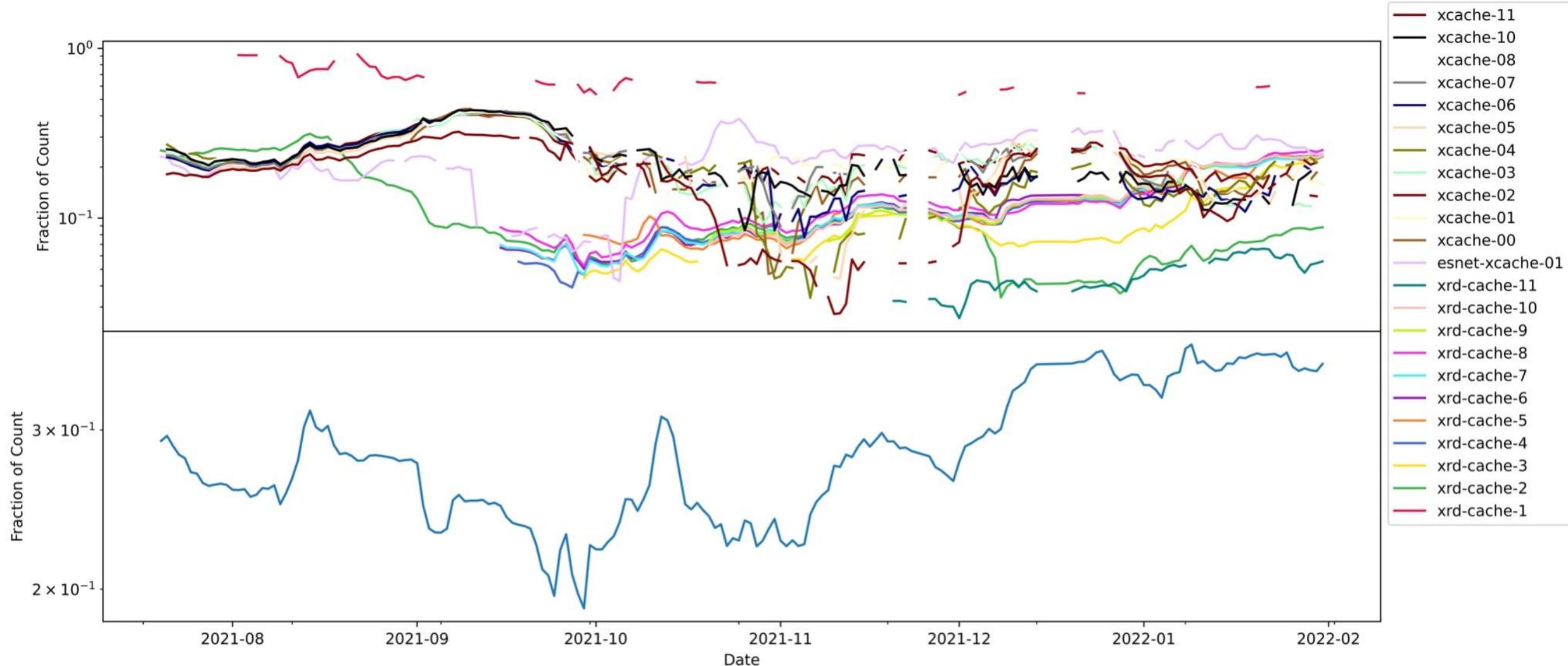
Daily data re-access fraction with moving average 10 days (in log scale)



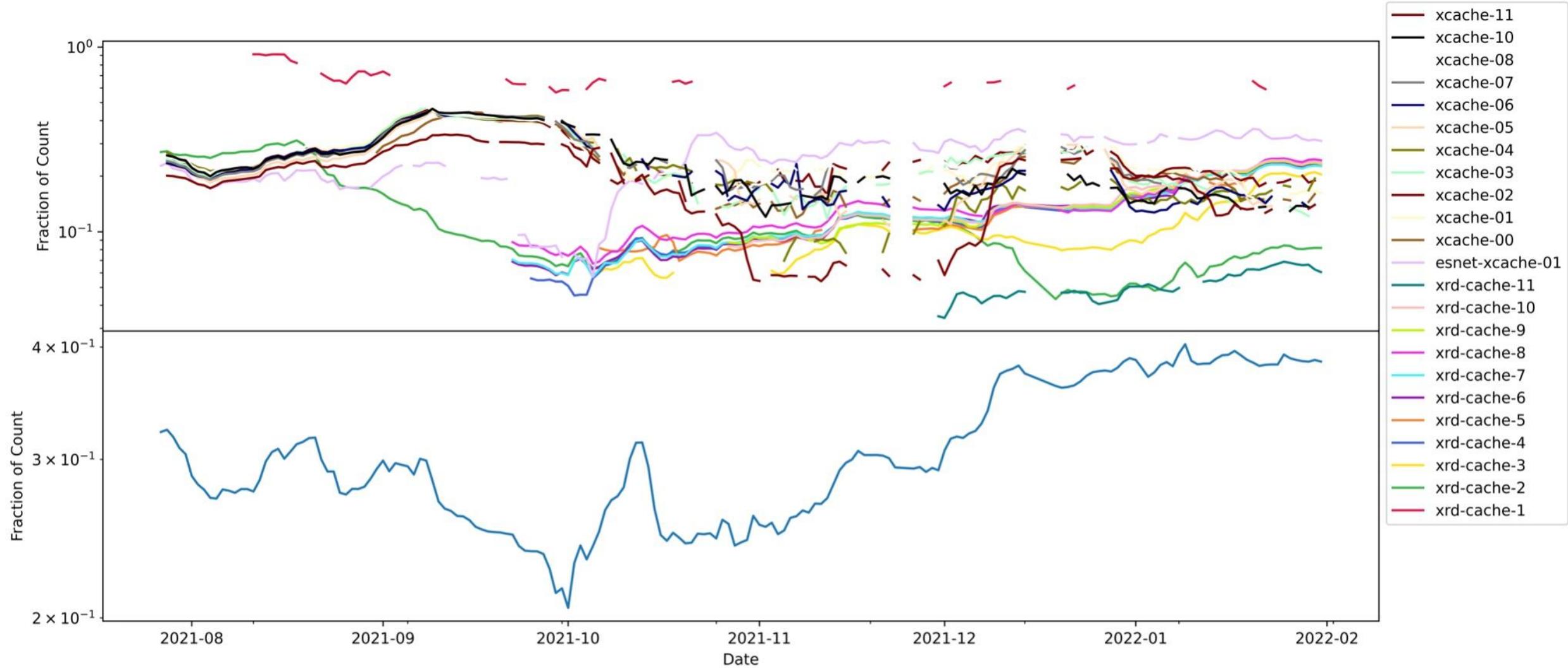
Daily data re-access fraction with moving average 14 days (in log scale)



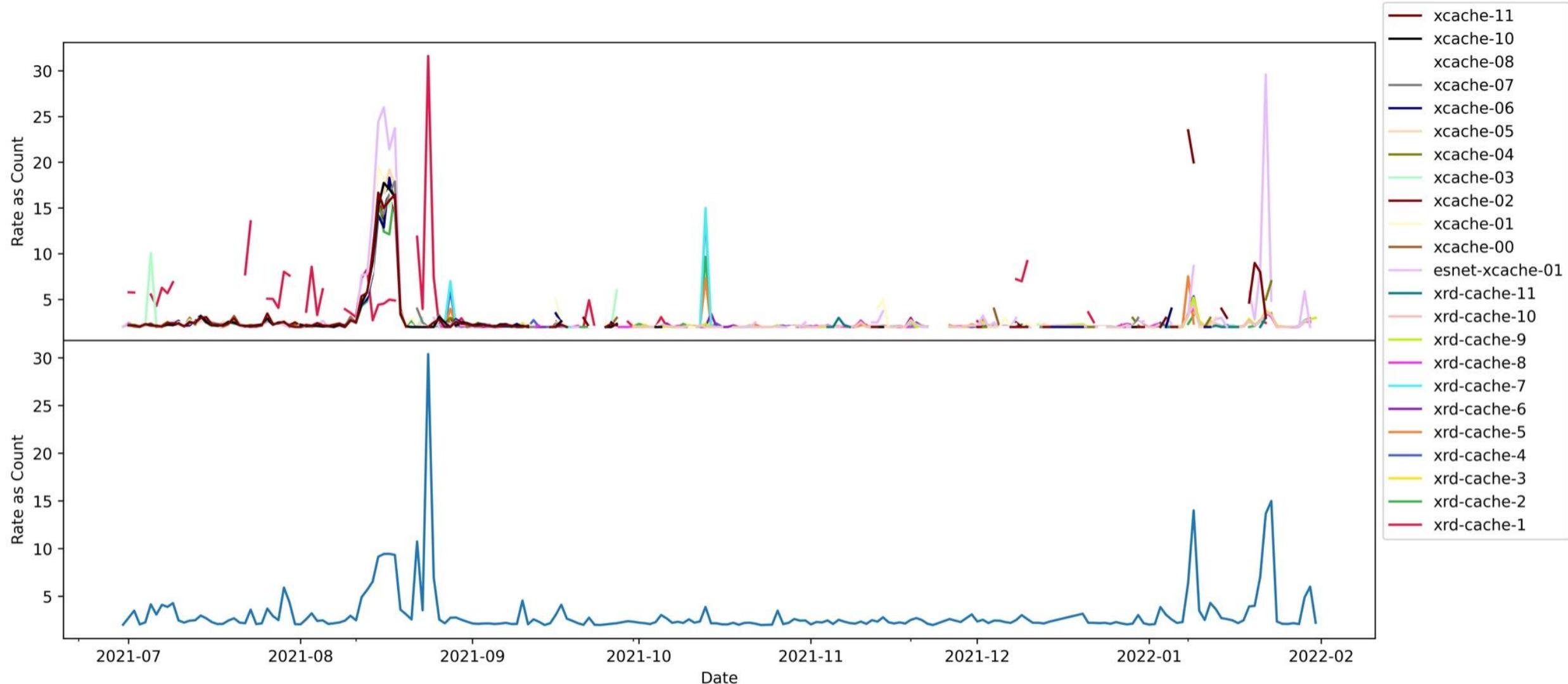
Daily data re-access fraction with moving average 21 days (in log scale)



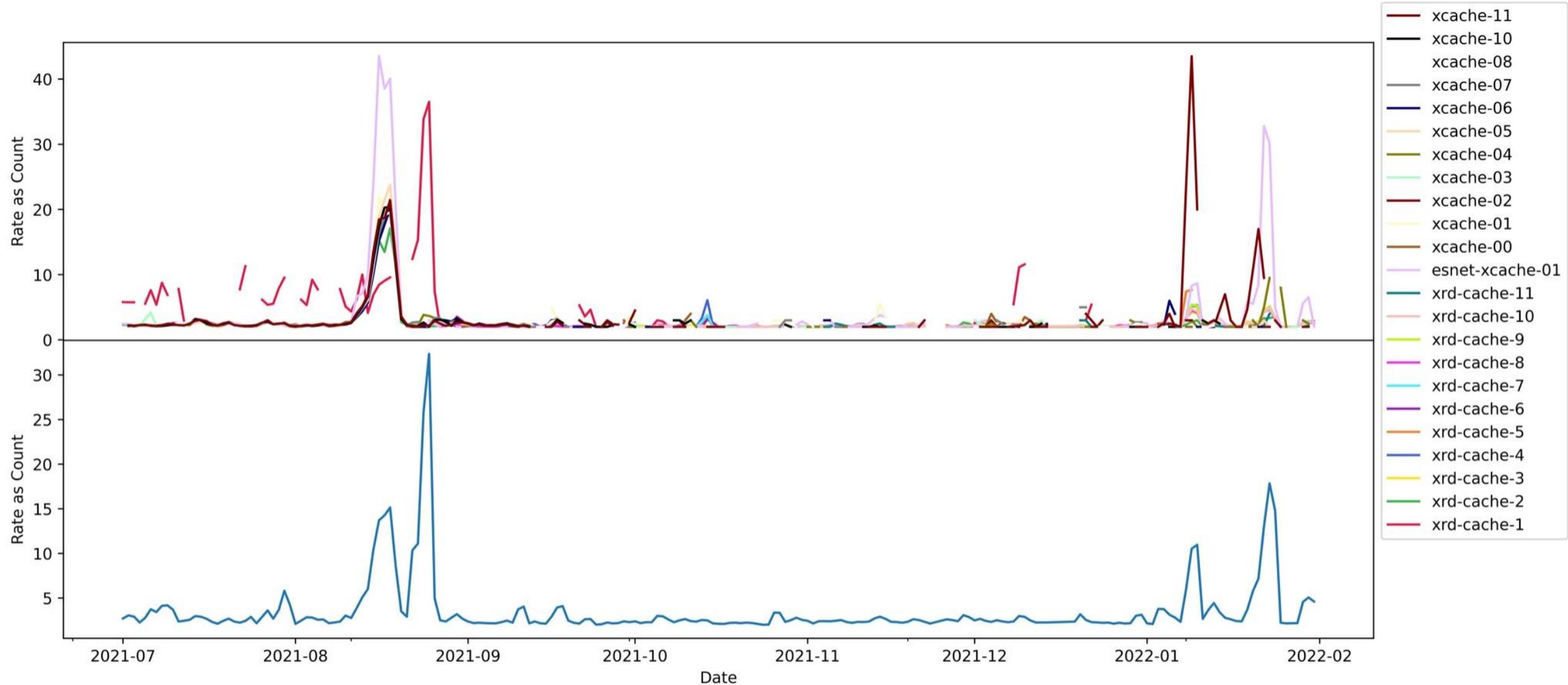
Daily data re-access fraction with moving average 28 days (in log scale)



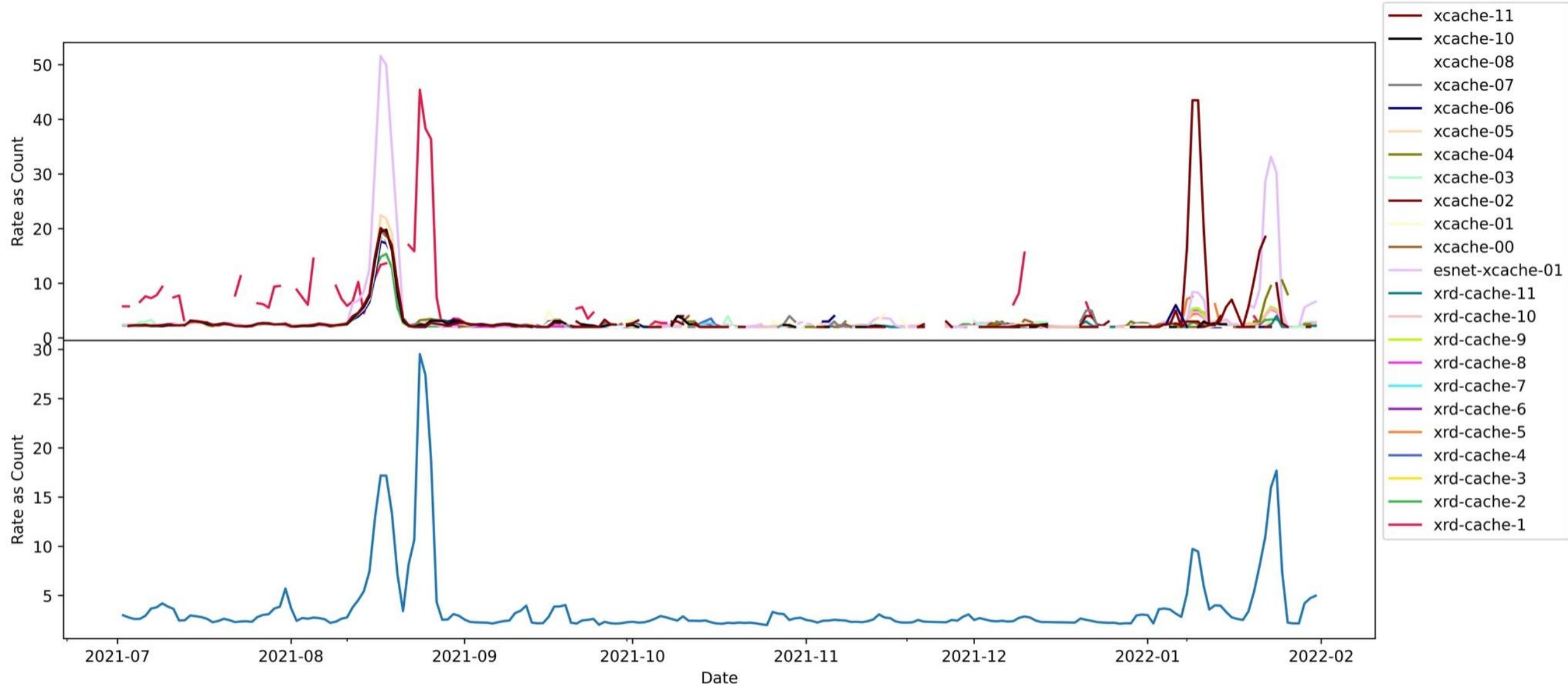
Daily data re-access rates with moving average 1 day



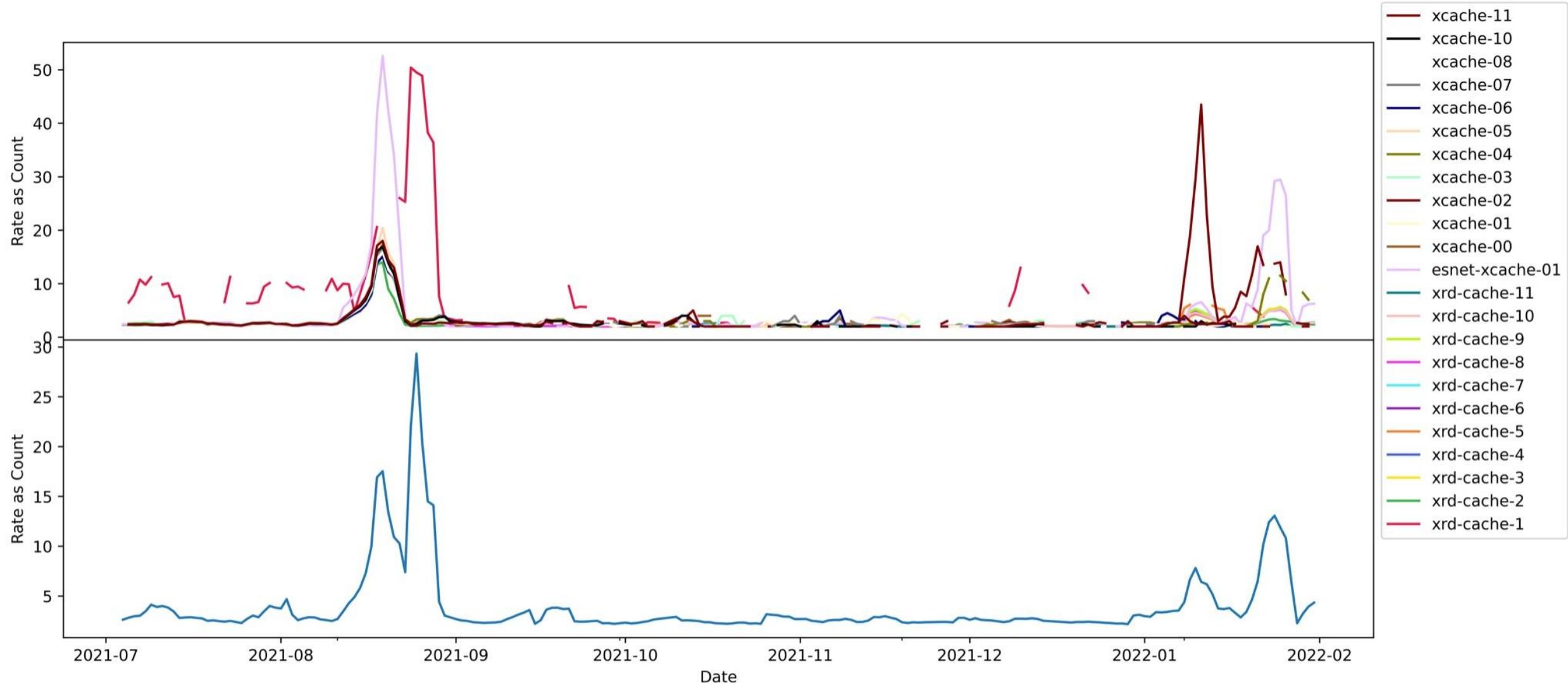
Daily data re-access rates with moving average 2 days



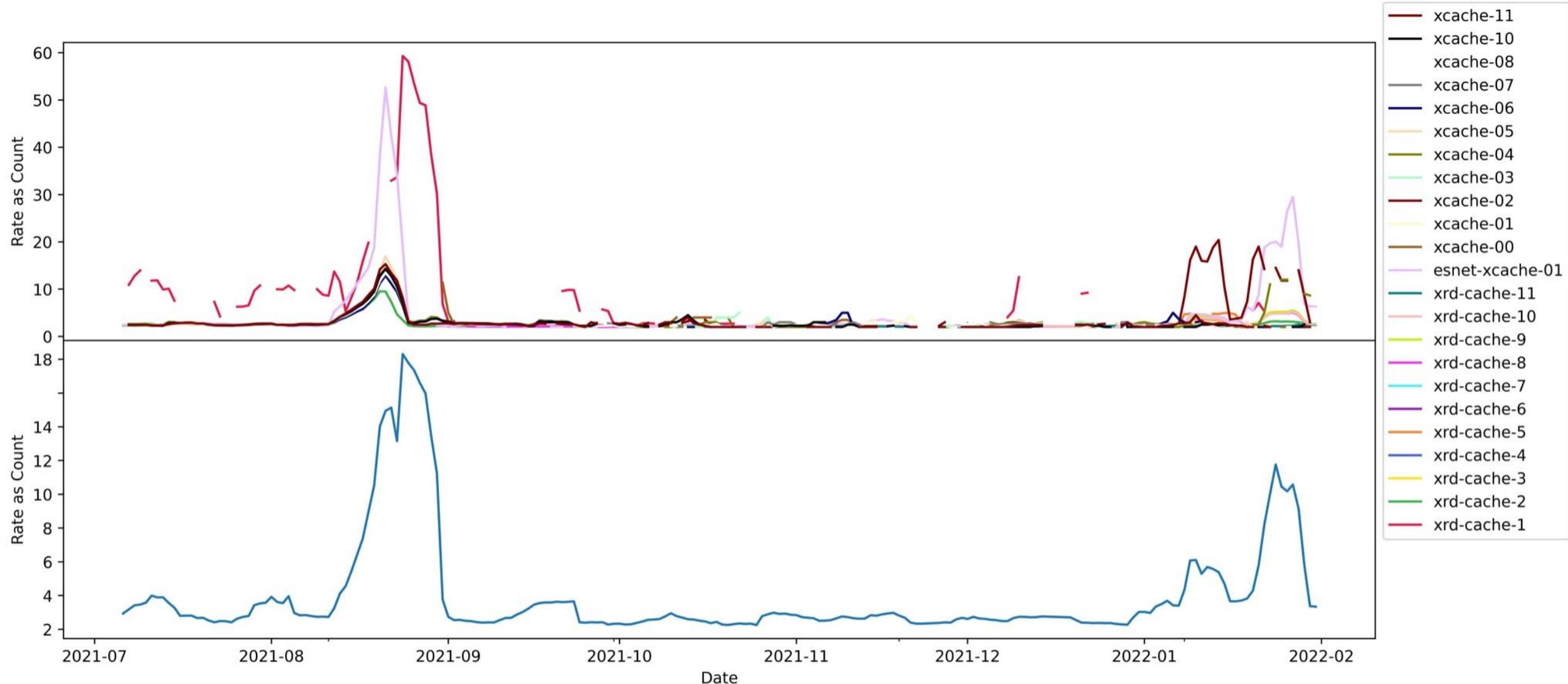
Daily data re-access rates with moving average 3 days



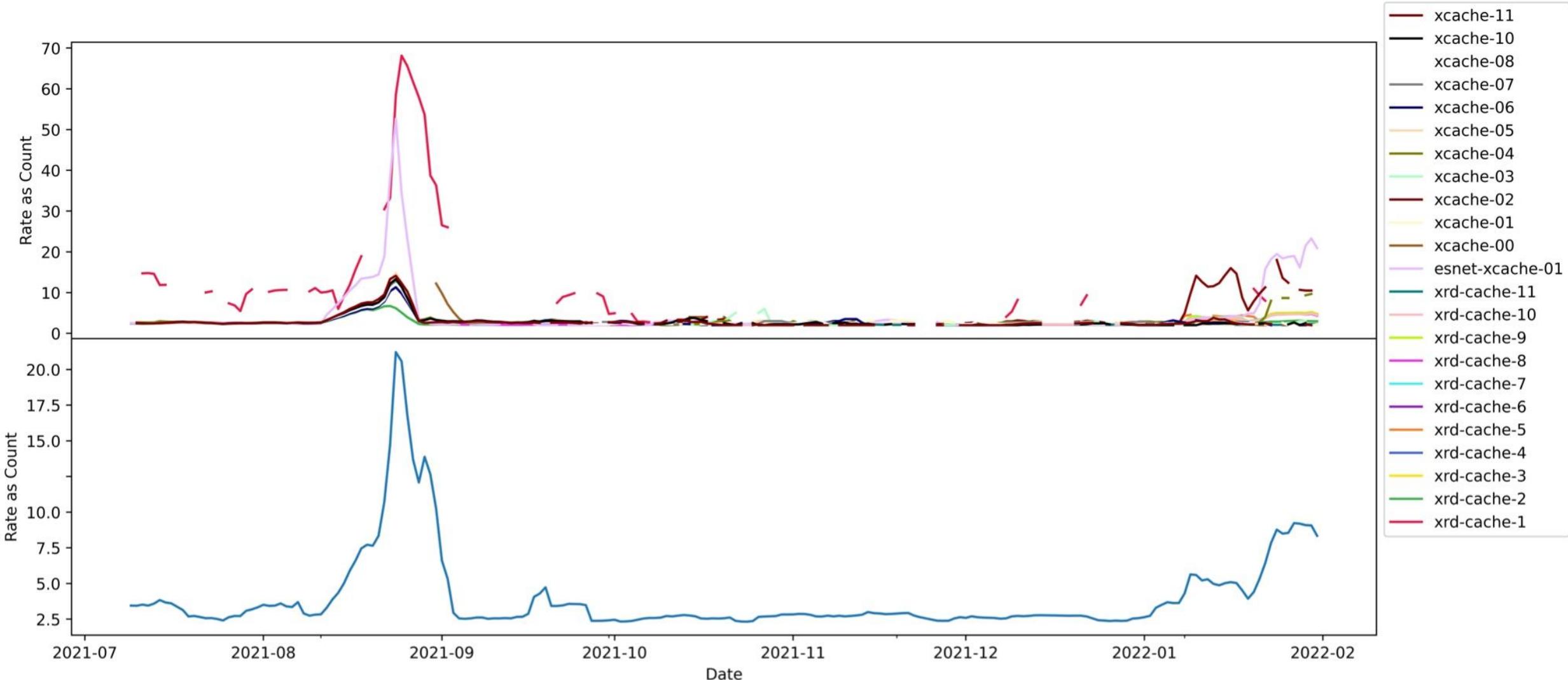
Daily data re-access rates with moving average 5 days



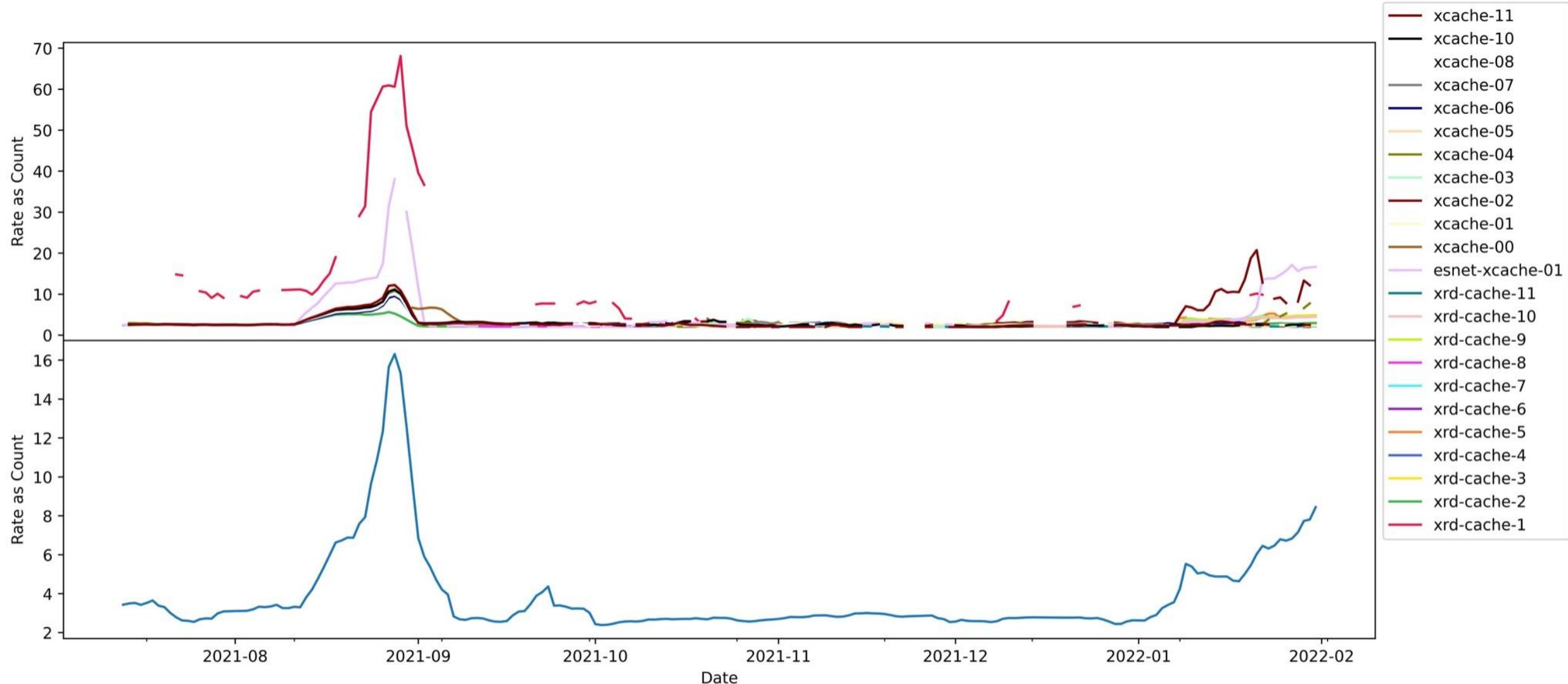
Daily data re-access rates with moving average 7 days



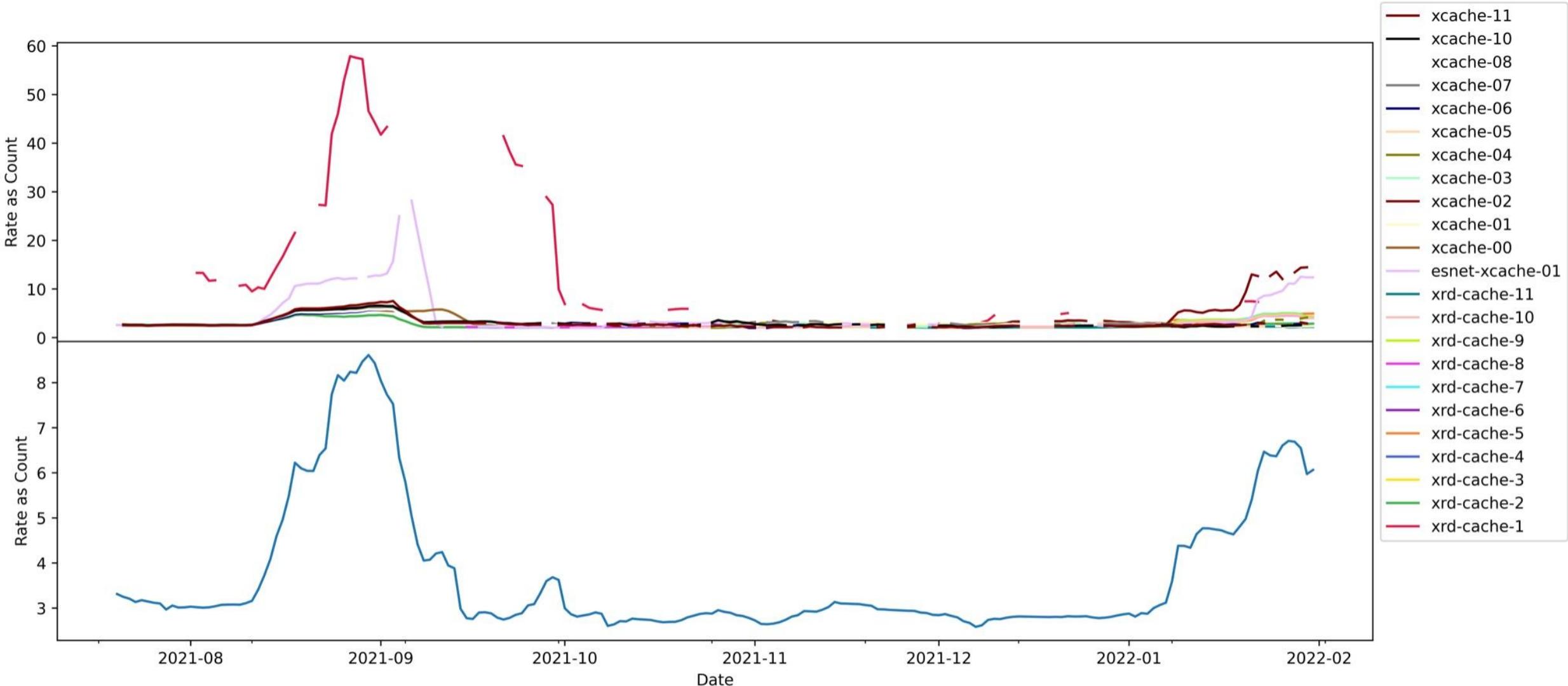
Daily data re-access rates with moving average 10 days



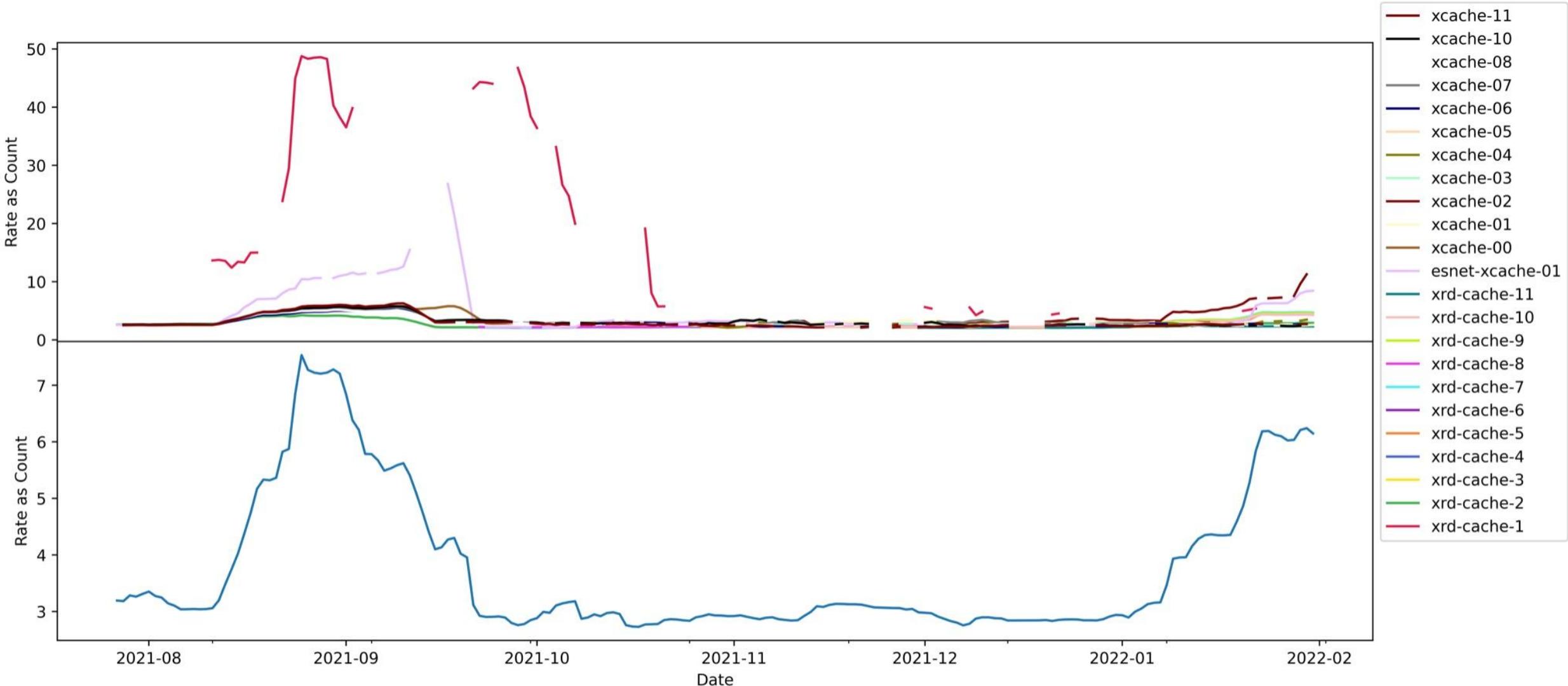
Daily data re-access rates with moving average 14 days



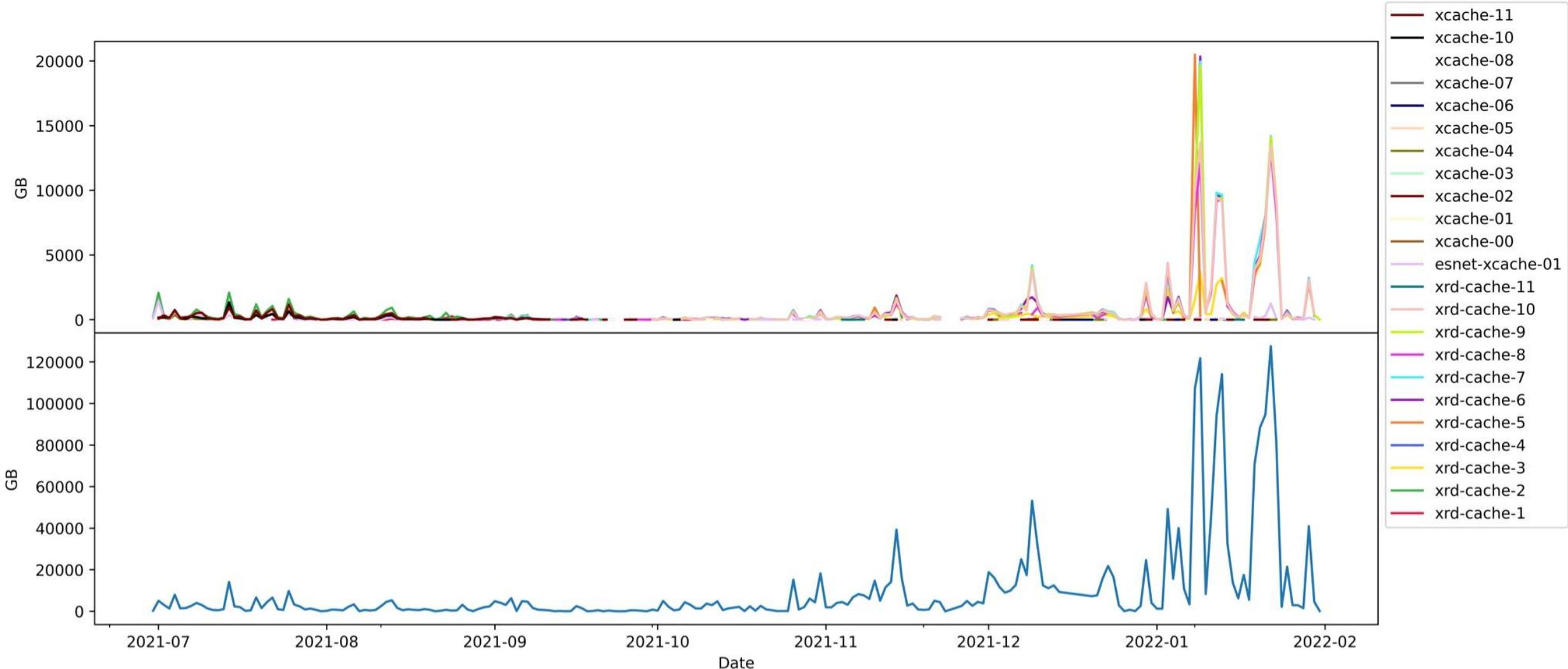
Daily data re-access rates with moving average 21 days



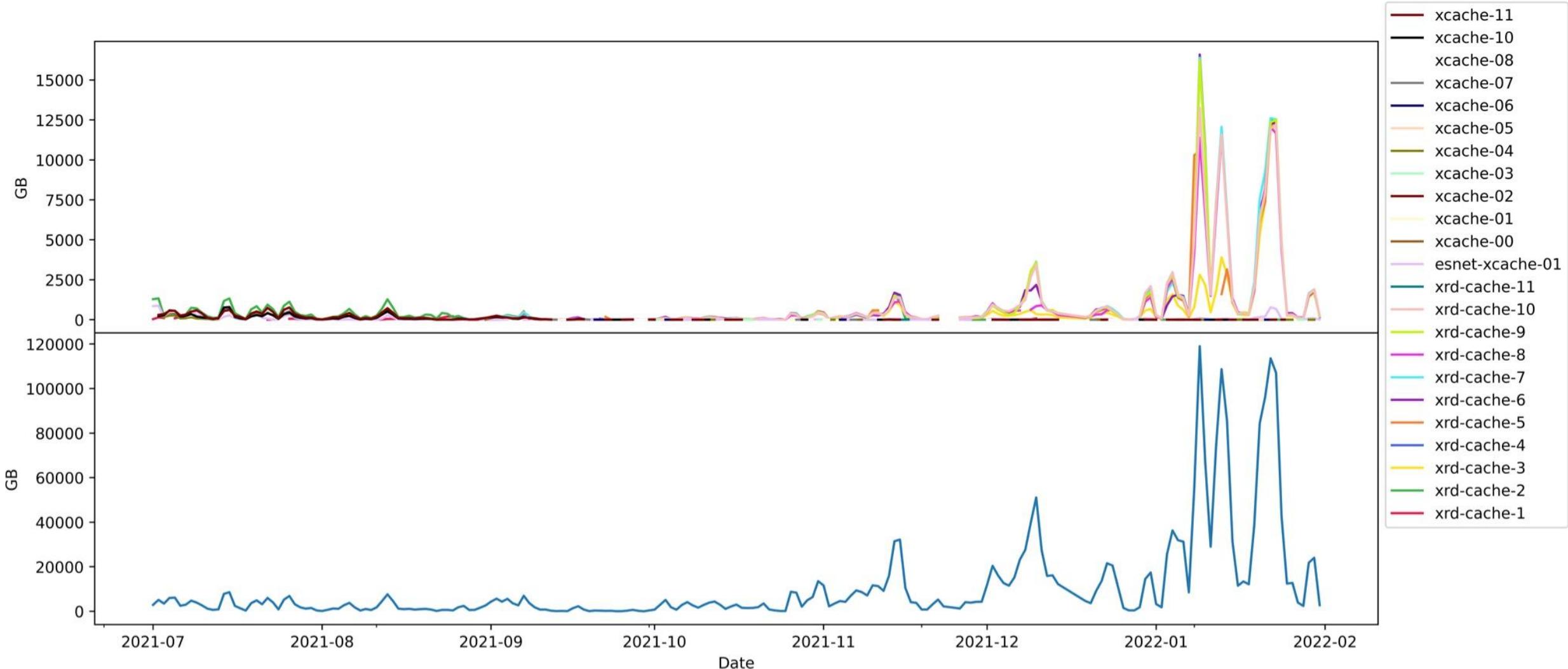
Daily data re-access rates with moving average 28 days



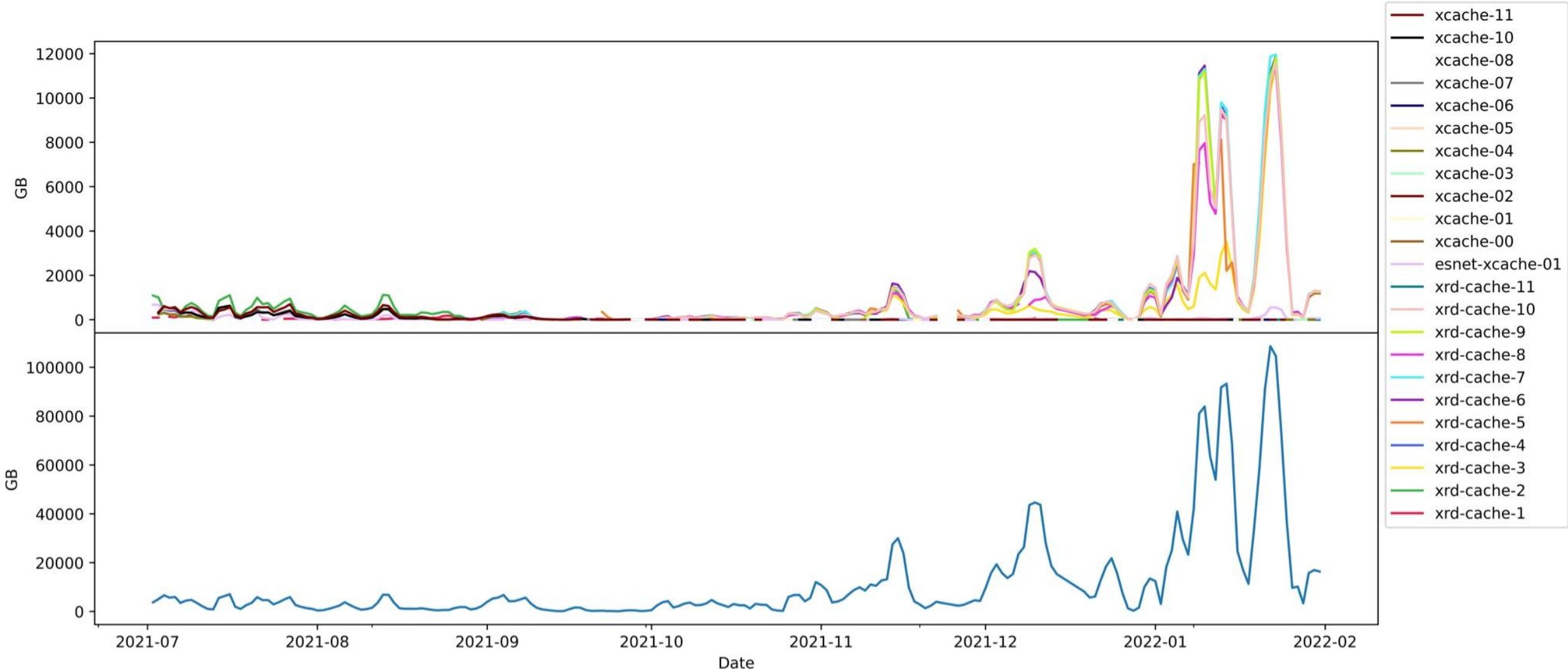
Daily data re-access size with moving average 1 day



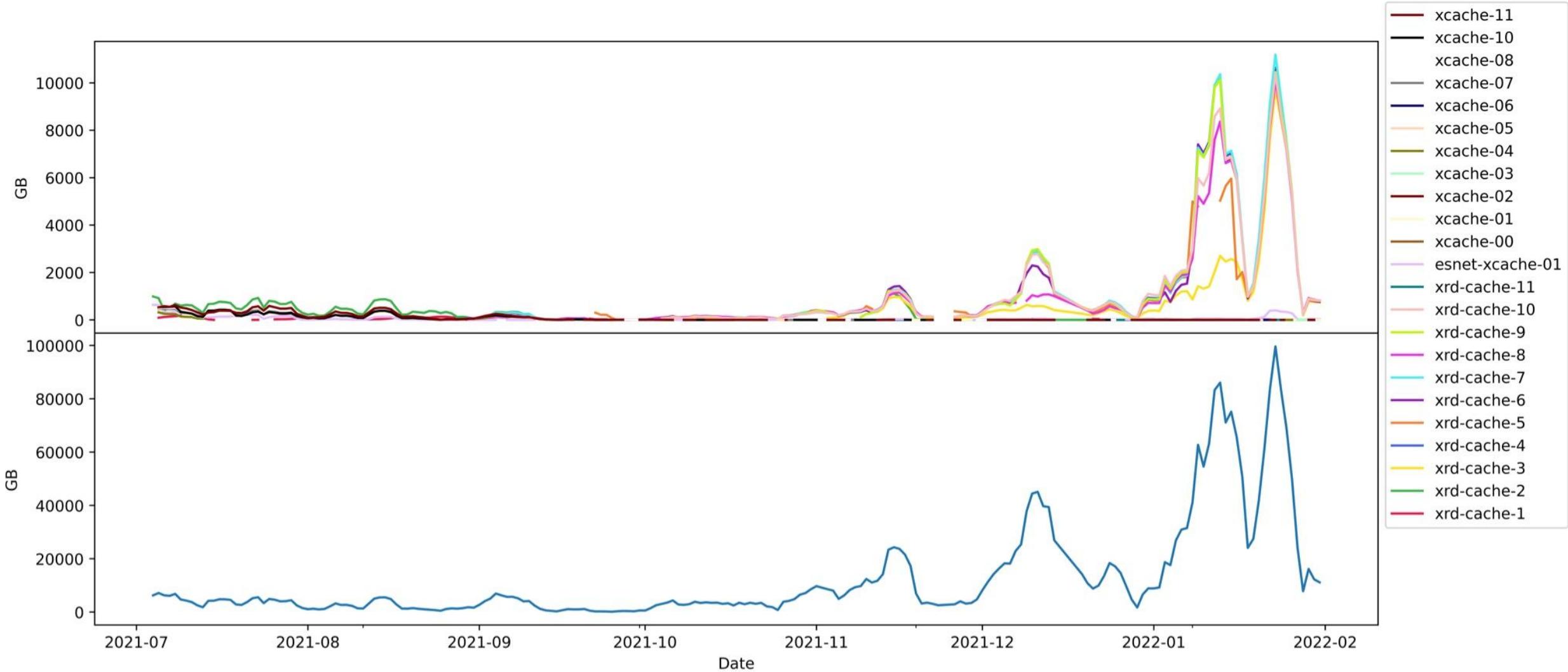
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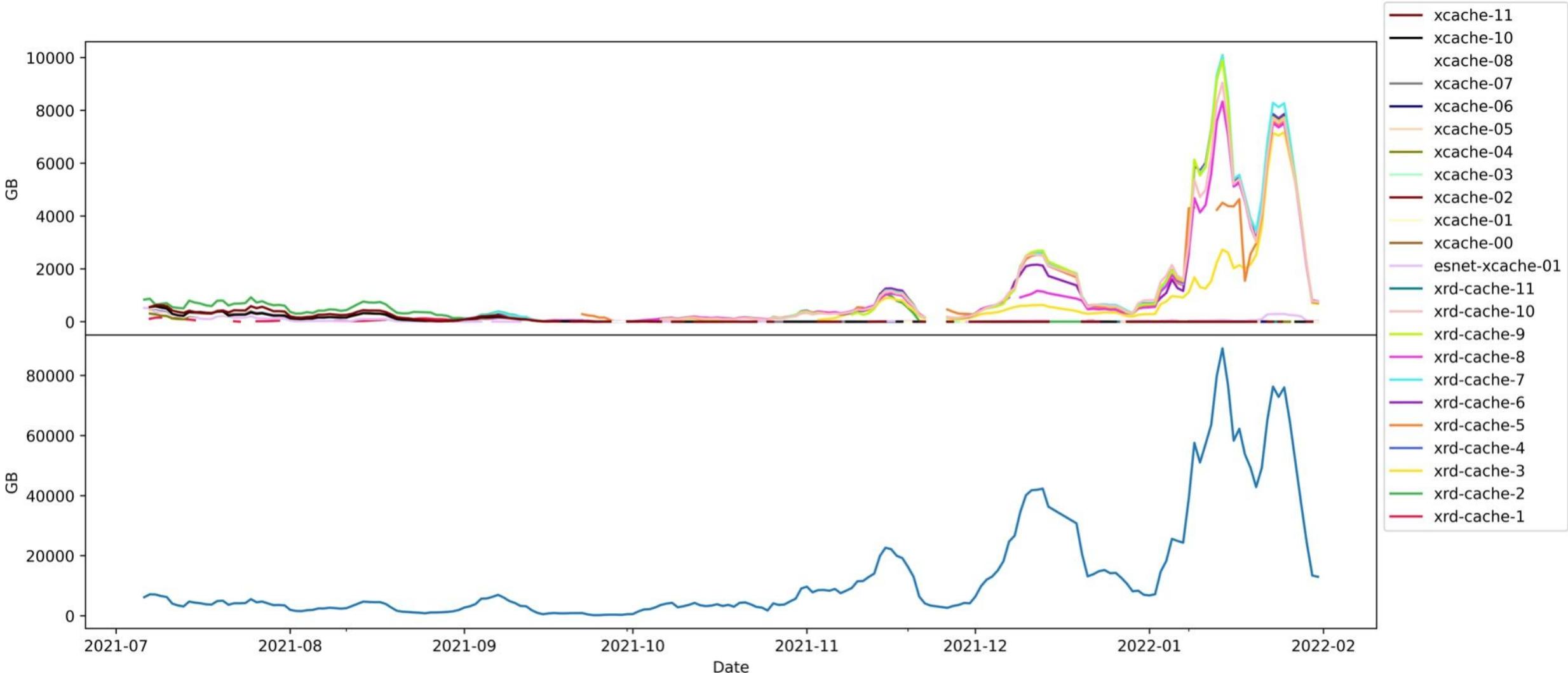
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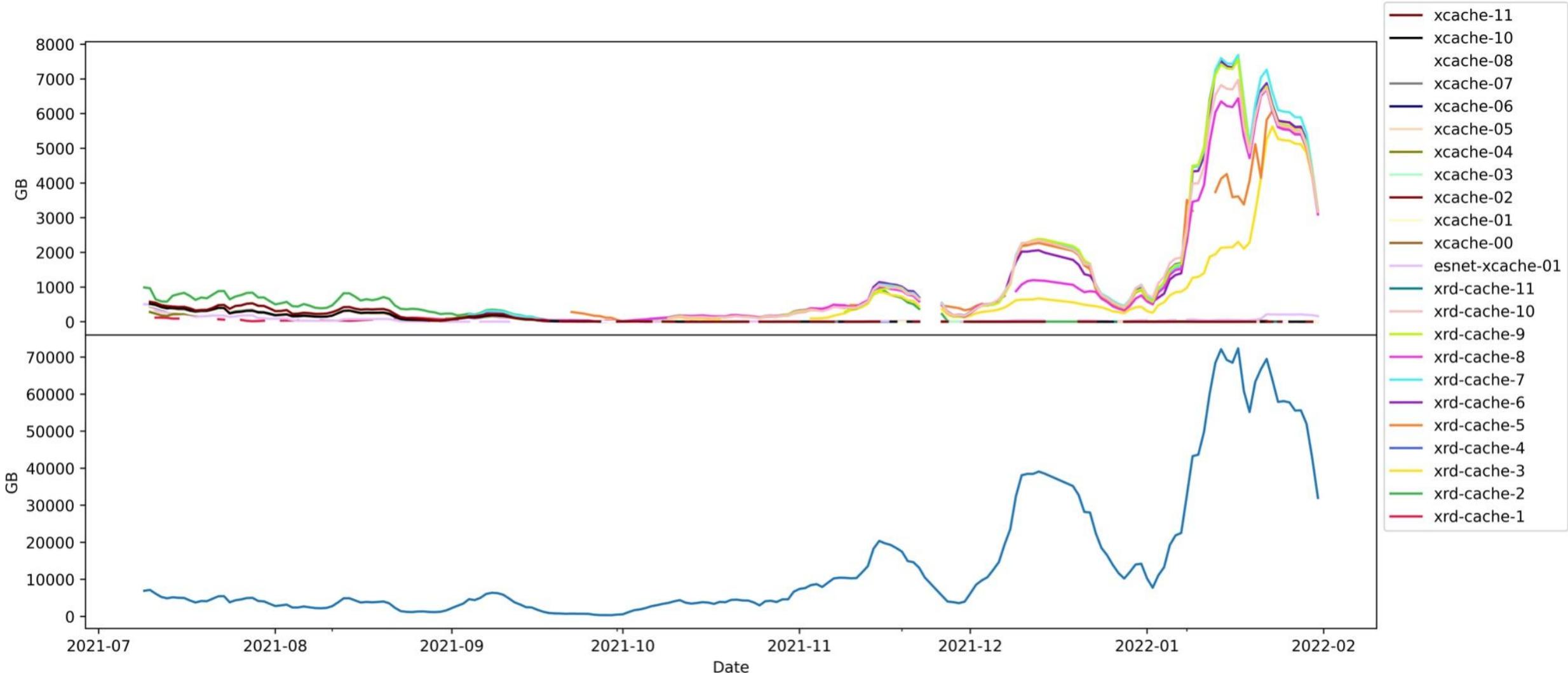
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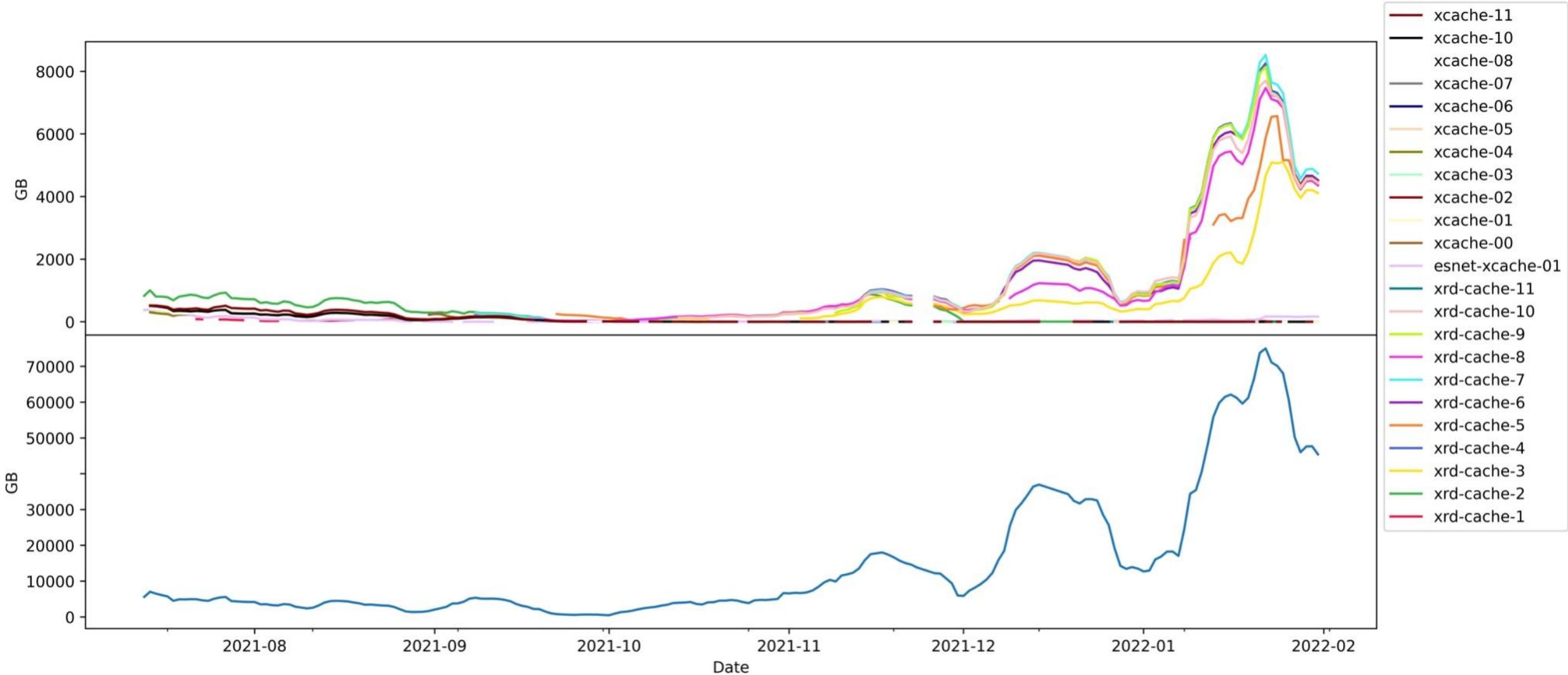
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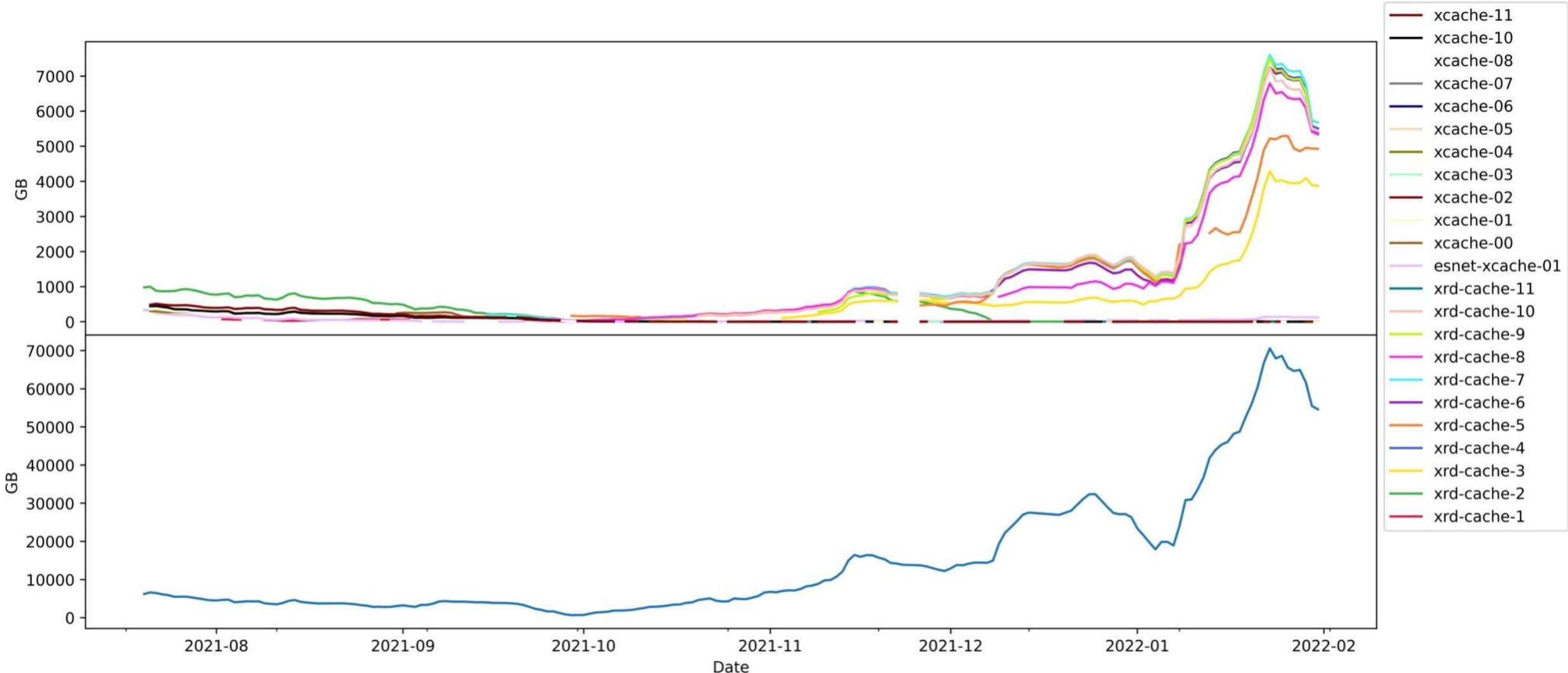
Daily data re-access size with moving average 10 days



Daily data re-access size with moving average 14 days



Daily data re-access size with moving average 21 days



Daily data re-access size with moving average 28 days

