

PIRAEUS BANK



Provision of Statistical Information on the Availability & Performance of rAPIdLink

April 2022 (2022 Q1)

To achieve optimum levels of provided service quality, the following KPIs are being calculated and monitored on a daily basis, regarding the availability and performance of the dedicated API interface and the online channel (winbank) used as benchmark:

1. Average daily uptime of all interfaces
2. Average daily downtime of all interfaces (both planned and unplanned)
3. Daily average response time per PIS request
4. Daily average response time per AIS request
5. Daily average response time per CoF request (to PIIS API)
6. Daily average error rate for ASPSP errors

Table 1 below summarizes the results of above.

| | Dedicated Interface | Online Interface (winbank) |
|--|--|-----------------------------------|
| Average daily downtime of all interface (see Table 2)s: * Planned, due to End-of-Day and Beginning-of-Day tasks * Unplanned | * < 1 min * < 1 min | * < 1 min * < 1 min |
| Average daily uptime of all interfaces (24h – average daily downtime) | 23h:59min | 23h:59min |
| Daily average error rate for ASPSP errors (see Table 3) | 0.13161% | - |
| Daily average response time per PIS request (see Table 4) | 2475 milliseconds (includes latency due to technical calls) | 1803 milliseconds |
| Daily average response time per AIS request (see Table 5) | 1509 milliseconds (includes latency due to technical calls) | 1327 milliseconds |
| Daily average response time per CoF request (see Table 6) | 0 milliseconds | - |

Table 1: Availability & Performance KPIs

During the first quarter, there were no requests performed from registered TPPs to our PSD2 PIIS APIs, for confirmation of funds. On the contrary, there were numerous calls to our PSD2 AIS APIs, for account information retrieval, and to our PSD2 PIS APIs for payment initiation.

Based on the definition of “downtime” as the amount of time during which the interface was unavailable (i.e. there were at least five consecutive AIS, PIS or CoF requests receiving errors with code “500” or “503” within a timeframe of 30 seconds), there were certain cases of unplanned downtime. These cases were mostly linked to unplanned downtime in the backend systems, which are common for both the dedicated (rapidlink) and web interface (winbank), although there were also a few cases where a massive request load from a couple of TPPs caused a momentary unavailability. Proper actions were taken to address the issue, by both contacting the TPPs and improving our APIs to sustain such traffic.

On the other hand, during the execution of planned maintenance and end-of-day (EOD) and beginning-of-day (BOD) tasks, there was little evidence of “downtime” on the dedicated interface within the particular period, due to the way the dedicated interface, the online channel and the backend services are implemented. More specifically, even if certain subsystems are “down”, rendering certain endpoints, like cards, unavailable, all other related resources are constantly available.

Table 2 below summarizes the downtime incidents within the particular period, while explaining their origin.

| From | To | Duration (Milliseconds) | Duration (Minutes) | Comments |
|-----------------------------|-----------------------------|----------------------------|-----------------------|------------------------------------|
| 2022-01-07 14:30:02.4050000 | 2022-01-07 14:30:03.5750000 | 1170 | 0.020 | rapidlink downtime |
| 2022-02-07 14:43:34.8740000 | 2022-02-07 14:43:38.6860000 | 3812 | 0.064 | rapidlink downtime |
| 2022-02-09 18:58:37.4030000 | 2022-02-09 18:59:21.6370000 | 44234 | 0.737 | winbank downtime |
| 2022-02-09 18:59:33.0590000 | 2022-02-09 19:01:45.4180000 | 132359 | 2.206 | winbank downtime |
| 2022-02-11 15:30:23.1480000 | 2022-02-11 15:30:25.8650000 | 2717 | 0.045 | winbank downtime |
| 2022-02-13 05:54:35.2730000 | 2022-02-13 11:10:52.3190000 | 18977046 | 316.284 | planned backend system maintenance |
| 2022-02-13 11:11:36.6370000 | 2022-02-13 11:11:36.6570000 | 20 | 0.000 | planned backend system maintenance |
| 2022-02-19 22:35:50.8260000 | 2022-02-19 22:36:11.2920000 | 20466 | 0.341 | winbank downtime |
| 2022-02-21 16:09:53.1210000 | 2022-02-21 16:10:47.8150000 | 54694 | 0.912 | rapidlink downtime |
| 2022-03-13 01:35:25.6970000 | 2022-03-13 01:35:46.3750000 | 20678 | 0.345 | winbank downtime |

Table 2: Downtime incidents

Moving on to the next KPI, the dedicated interface’s daily average error rate is calculated as the ratio of total daily number of requests returning an http error status code “500” (Internal Server Error) or “503” (Service Unavailable) to the total daily number of successful requests.

The following table summarizes the daily results for the particular period:

| date | # unsuccessful_requests | # successful_requests | error_rate |
|-----------|-------------------------|-----------------------|------------|
| 1/1/2022 | 15 | 97809 | 0.01534% |
| 2/1/2022 | 12 | 101916 | 0.01177% |
| 3/1/2022 | 24 | 101925 | 0.02355% |
| 4/1/2022 | 24 | 106001 | 0.02264% |
| 5/1/2022 | 21 | 101831 | 0.02062% |
| 6/1/2022 | 14 | 93995 | 0.01489% |
| 7/1/2022 | 26 | 106527 | 0.02441% |
| 8/1/2022 | 14 | 93362 | 0.01500% |
| 9/1/2022 | 17 | 101075 | 0.01682% |
| 10/1/2022 | 32 | 115036 | 0.02782% |
| 11/1/2022 | 31 | 99790 | 0.03107% |
| 12/1/2022 | 21 | 121014 | 0.01735% |
| 13/1/2022 | 7 | 114563 | 0.00611% |
| 14/1/2022 | 15 | 120300 | 0.01247% |
| 15/1/2022 | 17 | 101359 | 0.01677% |
| 16/1/2022 | 15 | 92315 | 0.01625% |
| 17/1/2022 | 19 | 104862 | 0.01812% |
| 18/1/2022 | 58 | 110039 | 0.05271% |
| 19/1/2022 | 25 | 97691 | 0.02559% |
| 20/1/2022 | 22 | 97350 | 0.02260% |
| 21/1/2022 | 25 | 97775 | 0.02557% |
| 22/1/2022 | 18 | 92847 | 0.01939% |
| 23/1/2022 | 13 | 87601 | 0.01484% |
| 24/1/2022 | 27 | 95971 | 0.02813% |
| 25/1/2022 | 25 | 88751 | 0.02817% |
| 26/1/2022 | 16 | 91983 | 0.01739% |
| 27/1/2022 | 24 | 100188 | 0.02395% |
| 28/1/2022 | 27 | 100267 | 0.02693% |
| 29/1/2022 | 20 | 83693 | 0.02390% |
| 30/1/2022 | 25 | 85577 | 0.02921% |
| 31/1/2022 | 33 | 108605 | 0.03039% |
| 1/2/2022 | 33 | 80901 | 0.04079% |
| 2/2/2022 | 8 | 69867 | 0.01145% |
| 3/2/2022 | 31 | 62241 | 0.04981% |
| 4/2/2022 | 3 | 71662 | 0.00419% |
| 5/2/2022 | 2 | 58467 | 0.00342% |

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|-----------|------|-------|----------|
| 6/2/2022 | 2 | 57260 | 0.00349% |
| 7/2/2022 | 12 | 73832 | 0.01625% |
| 8/2/2022 | 5 | 73756 | 0.00678% |
| 9/2/2022 | 59 | 70053 | 0.08422% |
| 10/2/2022 | 13 | 69694 | 0.01865% |
| 11/2/2022 | 27 | 68151 | 0.03962% |
| 12/2/2022 | 3 | 53811 | 0.00558% |
| 13/2/2022 | 4498 | 45305 | 9.92826% |
| 14/2/2022 | 16 | 70229 | 0.02278% |
| 15/2/2022 | 14 | 66444 | 0.02107% |
| 16/2/2022 | 7 | 67214 | 0.01041% |
| 17/2/2022 | 18 | 67467 | 0.02668% |
| 18/2/2022 | 4 | 66267 | 0.00604% |
| 19/2/2022 | 22 | 51575 | 0.04266% |
| 20/2/2022 | 3 | 49773 | 0.00603% |
| 21/2/2022 | 40 | 65934 | 0.06067% |
| 22/2/2022 | 10 | 65728 | 0.01521% |
| 23/2/2022 | 3 | 64371 | 0.00466% |
| 24/2/2022 | 2 | 65034 | 0.00308% |
| 25/2/2022 | 7 | 68199 | 0.01026% |
| 26/2/2022 | 20 | 54603 | 0.03663% |
| 27/2/2022 | 4 | 53453 | 0.00748% |
| 28/2/2022 | 65 | 68828 | 0.09444% |
| 1/3/2022 | 7 | 67641 | 0.01035% |
| 2/3/2022 | 19 | 63400 | 0.02997% |
| 3/3/2022 | 5 | 64350 | 0.00777% |
| 4/3/2022 | 4 | 65091 | 0.00615% |
| 5/3/2022 | 1 | 49574 | 0.00202% |
| 6/3/2022 | 0 | 48706 | 0.00000% |
| 7/3/2022 | 3 | 48060 | 0.00624% |
| 8/3/2022 | 11 | 68054 | 0.01616% |
| 9/3/2022 | 8 | 66650 | 0.01200% |
| 10/3/2022 | 8 | 65729 | 0.01217% |
| 11/3/2022 | 13 | 64606 | 0.02012% |
| 12/3/2022 | 3 | 53450 | 0.00561% |
| 13/3/2022 | 29 | 49815 | 0.05822% |
| 14/3/2022 | 1 | 62886 | 0.00159% |
| 15/3/2022 | 5 | 62319 | 0.00802% |
| 16/3/2022 | 16 | 63044 | 0.02538% |
| 17/3/2022 | 8 | 61694 | 0.01297% |
| 18/3/2022 | 1 | 60311 | 0.00166% |
| 19/3/2022 | 19 | 74958 | 0.02535% |
| 20/3/2022 | 12 | 63666 | 0.01885% |

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|---------------------------------|----|-------|-----------------|
| 21/3/2022 | 21 | 81414 | 0.02579% |
| 22/3/2022 | 26 | 79585 | 0.03267% |
| 23/3/2022 | 20 | 84548 | 0.02366% |
| 24/3/2022 | 25 | 81411 | 0.03071% |
| 25/3/2022 | 21 | 67206 | 0.03125% |
| 26/3/2022 | 19 | 70284 | 0.02703% |
| 27/3/2022 | 13 | 69952 | 0.01858% |
| 28/3/2022 | 22 | 91703 | 0.02399% |
| 29/3/2022 | 30 | 89740 | 0.03343% |
| 30/3/2022 | 26 | 89700 | 0.02899% |
| 31/3/2022 | 27 | 96993 | 0.02784% |
| Average Daily Error Rate | | | 0.13161% |

Table 3: Daily Error Rates of PSD2 APIs

Finally, regarding the average daily response times per service (AIS, PIS, CoF), as mentioned previously, traffic data showed that only AIS and PIS endpoints were called during the selected period. Therefore, Table 6 is empty, while Tables 4 and 5 summarize the results for PSD2 PIS and AIS APIs respectively. It must be stressed that average response times from the dedicated interface also include latency caused by technical calls.

| Date | Number of requests | Average response time for PSD2_PIS APIs (milliseconds) |
|-------------|---------------------------|---|
| 2/1/2022 | 7 | 2037 |
| 4/1/2022 | 17 | 2367 |
| 5/1/2022 | 10 | 2112 |
| 6/1/2022 | 7 | 1848 |
| 7/1/2022 | 10 | 2198 |
| 8/1/2022 | 2 | 3444 |
| 10/1/2022 | 5 | 1787 |
| 11/1/2022 | 31 | 708 |
| 12/1/2022 | 9 | 2600 |
| 13/1/2022 | 14 | 1636 |
| 14/1/2022 | 31 | 1593 |
| 17/1/2022 | 4 | 2123 |
| 18/1/2022 | 2 | 3080 |
| 20/1/2022 | 9 | 2064 |
| 21/1/2022 | 13 | 1942 |
| 24/1/2022 | 4 | 2038 |

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|-----------|----|-------|
| 25/1/2022 | 7 | 1912 |
| 26/1/2022 | 7 | 2903 |
| 27/1/2022 | 16 | 2219 |
| 28/1/2022 | 9 | 2292 |
| 30/1/2022 | 5 | 1742 |
| 1/2/2022 | 8 | 2037 |
| 2/2/2022 | 2 | 2530 |
| 3/2/2022 | 16 | 1932 |
| 4/2/2022 | 2 | 2754 |
| 6/2/2022 | 36 | 1074 |
| 7/2/2022 | 24 | 1488 |
| 8/2/2022 | 1 | 3475 |
| 9/2/2022 | 2 | 1853 |
| 10/2/2022 | 21 | 2432 |
| 11/2/2022 | 5 | 6463 |
| 12/2/2022 | 7 | 1984 |
| 13/2/2022 | 4 | 1992 |
| 15/2/2022 | 20 | 2201 |
| 16/2/2022 | 35 | 1787 |
| 17/2/2022 | 4 | 2071 |
| 18/2/2022 | 3 | 2968 |
| 20/2/2022 | 2 | 3109 |
| 21/2/2022 | 11 | 2163 |
| 23/2/2022 | 3 | 3019 |
| 24/2/2022 | 4 | 1924 |
| 25/2/2022 | 1 | 265 |
| 27/2/2022 | 2 | 3534 |
| 28/2/2022 | 11 | 11288 |
| 1/3/2022 | 15 | 4068 |
| 2/3/2022 | 9 | 2410 |
| 3/3/2022 | 4 | 2068 |
| 4/3/2022 | 20 | 2142 |
| 5/3/2022 | 5 | 2291 |
| 6/3/2022 | 6 | 1837 |
| 8/3/2022 | 5 | 2540 |
| 9/3/2022 | 6 | 2360 |
| 10/3/2022 | 9 | 2090 |
| 11/3/2022 | 4 | 2142 |
| 12/3/2022 | 4 | 2049 |
| 13/3/2022 | 9 | 1513 |
| 14/3/2022 | 6 | 2236 |
| 16/3/2022 | 16 | 3767 |
| 17/3/2022 | 8 | 1622 |

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|----------------|----|-----------------------------|
| 18/3/2022 | 5 | 2980 |
| 23/3/2022 | 2 | 2930 |
| 24/3/2022 | 10 | 2340 |
| 25/3/2022 | 5 | 1958 |
| 27/3/2022 | 4 | 2036 |
| 28/3/2022 | 11 | 4247 |
| 29/3/2022 | 13 | 2496 |
| 30/3/2022 | 1 | 3001 |
| 31/3/2022 | 4 | 2170 |
| Average | | 2474.72 milliseconds |

Table 4: Daily average response times per PIS request

| Date | Number of requests | Average response time for PSD2_AIS APIs (milliseconds) |
|-------------|---------------------------|---|
| 1/1/2022 | 97824 | 1216 |
| 2/1/2022 | 101921 | 1194 |
| 3/1/2022 | 101949 | 1428 |
| 4/1/2022 | 106008 | 1370 |
| 5/1/2022 | 101842 | 1373 |
| 6/1/2022 | 94002 | 1193 |
| 7/1/2022 | 106543 | 1352 |
| 8/1/2022 | 93374 | 1231 |
| 9/1/2022 | 101092 | 1174 |
| 10/1/2022 | 115063 | 1324 |
| 11/1/2022 | 99790 | 1307 |
| 12/1/2022 | 121026 | 1360 |
| 13/1/2022 | 114556 | 1359 |
| 14/1/2022 | 120284 | 1367 |
| 15/1/2022 | 101376 | 1226 |
| 16/1/2022 | 92330 | 1177 |
| 17/1/2022 | 104877 | 1350 |
| 18/1/2022 | 110095 | 1366 |
| 19/1/2022 | 97716 | 1394 |
| 20/1/2022 | 97363 | 1454 |
| 21/1/2022 | 97787 | 1422 |
| 22/1/2022 | 92865 | 1264 |
| 23/1/2022 | 87614 | 1218 |
| 24/1/2022 | 95994 | 1359 |
| 25/1/2022 | 88769 | 1326 |
| 26/1/2022 | 91992 | 1452 |
| 27/1/2022 | 100196 | 1515 |
| 28/1/2022 | 100285 | 1548 |
| 29/1/2022 | 83713 | 1375 |
| 30/1/2022 | 85597 | 1311 |
| 31/1/2022 | 108638 | 1664 |
| 1/2/2022 | 80926 | 1713 |
| 2/2/2022 | 69873 | 1710 |
| 3/2/2022 | 62256 | 1804 |
| 4/2/2022 | 71663 | 1662 |
| 5/2/2022 | 58469 | 1425 |
| 6/2/2022 | 57226 | 1337 |
| 7/2/2022 | 73820 | 1618 |
| 8/2/2022 | 73760 | 1530 |
| 9/2/2022 | 70110 | 1627 |
| 10/2/2022 | 69686 | 1658 |
| 11/2/2022 | 68173 | 1647 |

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|-----------|-------|------|
| 12/2/2022 | 53807 | 1437 |
| 13/2/2022 | 49799 | 2724 |
| 14/2/2022 | 70245 | 1541 |
| 15/2/2022 | 66438 | 1572 |
| 16/2/2022 | 67186 | 1554 |
| 17/2/2022 | 67481 | 1544 |
| 18/2/2022 | 66268 | 1535 |
| 19/2/2022 | 51597 | 1381 |
| 20/2/2022 | 49774 | 1301 |
| 21/2/2022 | 65963 | 1683 |
| 22/2/2022 | 65738 | 1514 |
| 23/2/2022 | 64371 | 1598 |
| 24/2/2022 | 65032 | 1583 |
| 25/2/2022 | 68205 | 1653 |
| 26/2/2022 | 54623 | 1476 |
| 27/2/2022 | 53455 | 1365 |
| 28/2/2022 | 68882 | 2258 |
| 1/3/2022 | 67633 | 1722 |
| 2/3/2022 | 63410 | 1760 |
| 3/3/2022 | 64351 | 1683 |
| 4/3/2022 | 65075 | 1666 |
| 5/3/2022 | 49570 | 1444 |
| 6/3/2022 | 48700 | 1360 |
| 7/3/2022 | 48063 | 1381 |
| 8/3/2022 | 68060 | 1684 |
| 9/3/2022 | 66652 | 1624 |
| 10/3/2022 | 65728 | 1680 |
| 11/3/2022 | 64615 | 1695 |
| 12/3/2022 | 53449 | 1435 |
| 13/3/2022 | 49835 | 1227 |
| 14/3/2022 | 62881 | 1666 |
| 15/3/2022 | 62324 | 1737 |
| 16/3/2022 | 63044 | 1731 |
| 17/3/2022 | 61694 | 1652 |
| 18/3/2022 | 60307 | 1691 |
| 19/3/2022 | 74977 | 1447 |
| 20/3/2022 | 63678 | 1289 |
| 21/3/2022 | 81435 | 1596 |
| 22/3/2022 | 79611 | 1590 |
| 23/3/2022 | 84566 | 1640 |
| 24/3/2022 | 81426 | 1640 |
| 25/3/2022 | 67222 | 1389 |
| 26/3/2022 | 70303 | 1399 |

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|----------------|-------|-----------------------------|
| 27/3/2022 | 69961 | 1357 |
| 28/3/2022 | 91714 | 1586 |
| 29/3/2022 | 89757 | 1585 |
| 30/3/2022 | 89725 | 1674 |
| 31/3/2022 | 97016 | 1685 |
| Average | | 1509.27 milliseconds |

Table 5: Daily average response times per AIS request

| Date | Number of requests | Average response time for PSD2_PPIS APIs (milliseconds) |
|----------------|---------------------------|--|
| - | - | - |
| Average | | 0 milliseconds |

Table 6: Daily average response times per CoF request