Leica Microsystems

China Site Mirror Hosting

Case Study

CDS Global Cloud
April, 2017

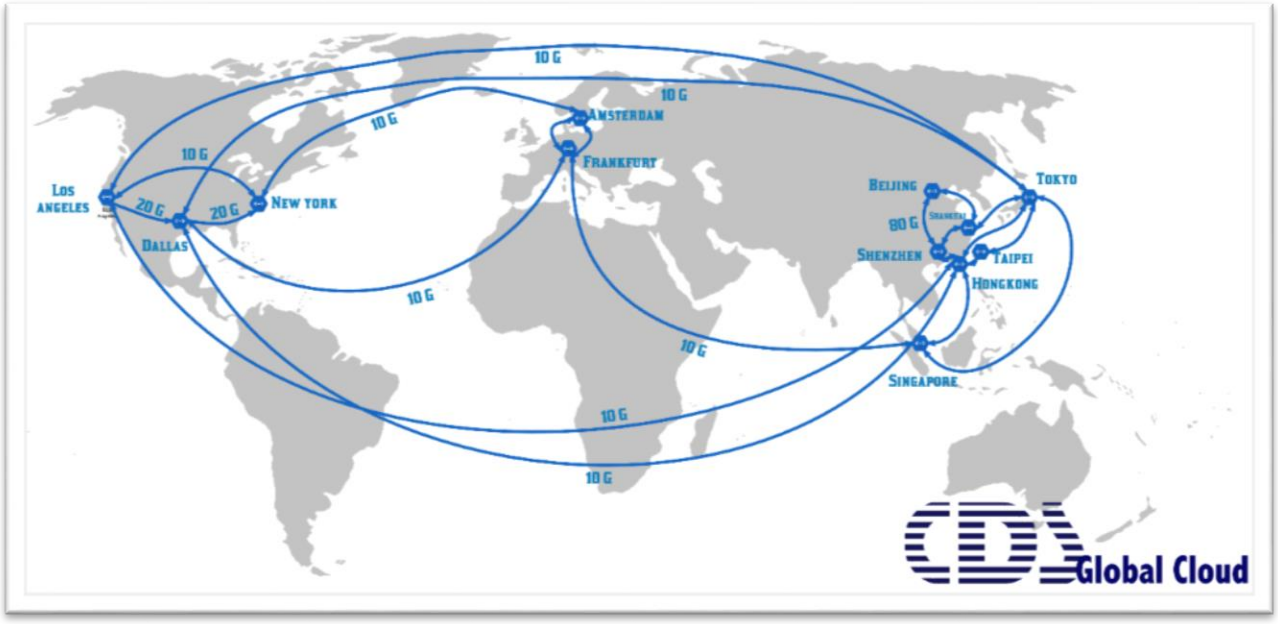
1. About CDS Global Cloud

CDS Global Cloud is a rapidly expanding international IaaS provider with multiple data centers in Asia, Europe and North America. Our Infrastructure-As-A-Service solutions and Global Private Network (GPN) are built to address the complete spectrum of enterprise workloads and support hybrid Cloud or dedicated Cloud architectures as well as colocation and migration.

With global sales office located in Dallas, Texas, CDS has rolled out data centers in the United States, Japan, Singapore, Amsterdam, Germany, China, Hong Kong, Taiwan and opening soon – Dubai and India. With the extensive footprint throughout the world, CDS is trusted by enterprises around the world to run their mission-critical applications in the Cloud.

CDS Global Cloud's parent company, Capital Online Technology, is the only non-government controlled cloud host in Mainland China with access to a dedicated, Layer 2 Internet connection between China and the rest of the world. Historically limited to state owned carriers in 2005 CDS's affiliate, Capital Online Technologies, became the first and the only non-governmental cloud hosting company to acquire access to one of these dedicated networks. In addition, Capital Technology is one of the very few internet providers with 4-line BGP capabilities in Mainland China.

Worldwide, CDS Global Cloud offers a reliable, fully virtualized Cloud platform with hybrid or dedicated hosting abilities, SSD+SAS+SATA Cloud storage and dedicated network capabilities. Together with Capitalonline Technology, CDS specialized in offering a cost effective dedicated Internet connection through the Great Fire Wall and high-speed internet access inside China.



2. Problem Description

Leica Micro Systems has its global website www.leica-microsystems.com is hosted in G[redacted]y.

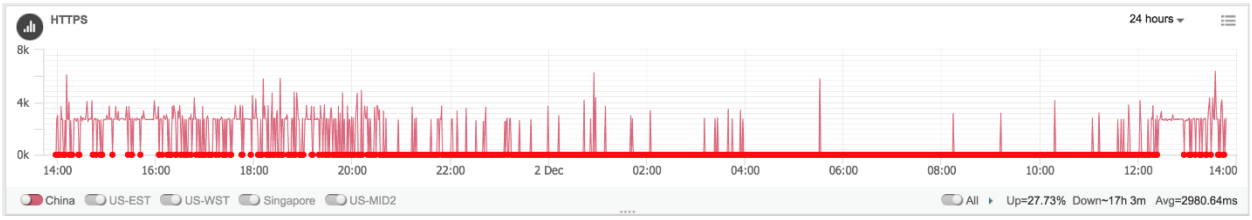
China office is managing a translated version of the global website (www.leica-microsystems.com/cn, hosted in Ge[redacted]y as well)

Problems

- Access speed to domain hosted outside China from inside China is slow. Verified with various other domains and setups.
- The site was blocked early May 2015 from inside China. We solved the block with changing the main website IP, which is not ideal as permanent solution.
- Leica is looking for a solution concept to improve the situation, both speed and access when the great firewall blocks the main site.
- The domain has about [redacted] sessions per month.
- [redacted] of all sessions to www.leica-microsystems.com are related to China.
- The site is built with a content management system (www.typo3.org) and hosted in Hamburg, Germany.
- All content elements like text, images and downloadable files can be changed by local editors.
- Connection to Salesforce (www.salesforce.com) and Pardot (www.pardot.com) tracking to send form requests from the website (web2lead connector from Salesforce, user tracking through Pardot)

3. Problem Diagnoses

Upon receiving the request, CDS conducted a quick website uptime monitor from China location, the web server was down 17hours in a 24hours monitor period on a random day.

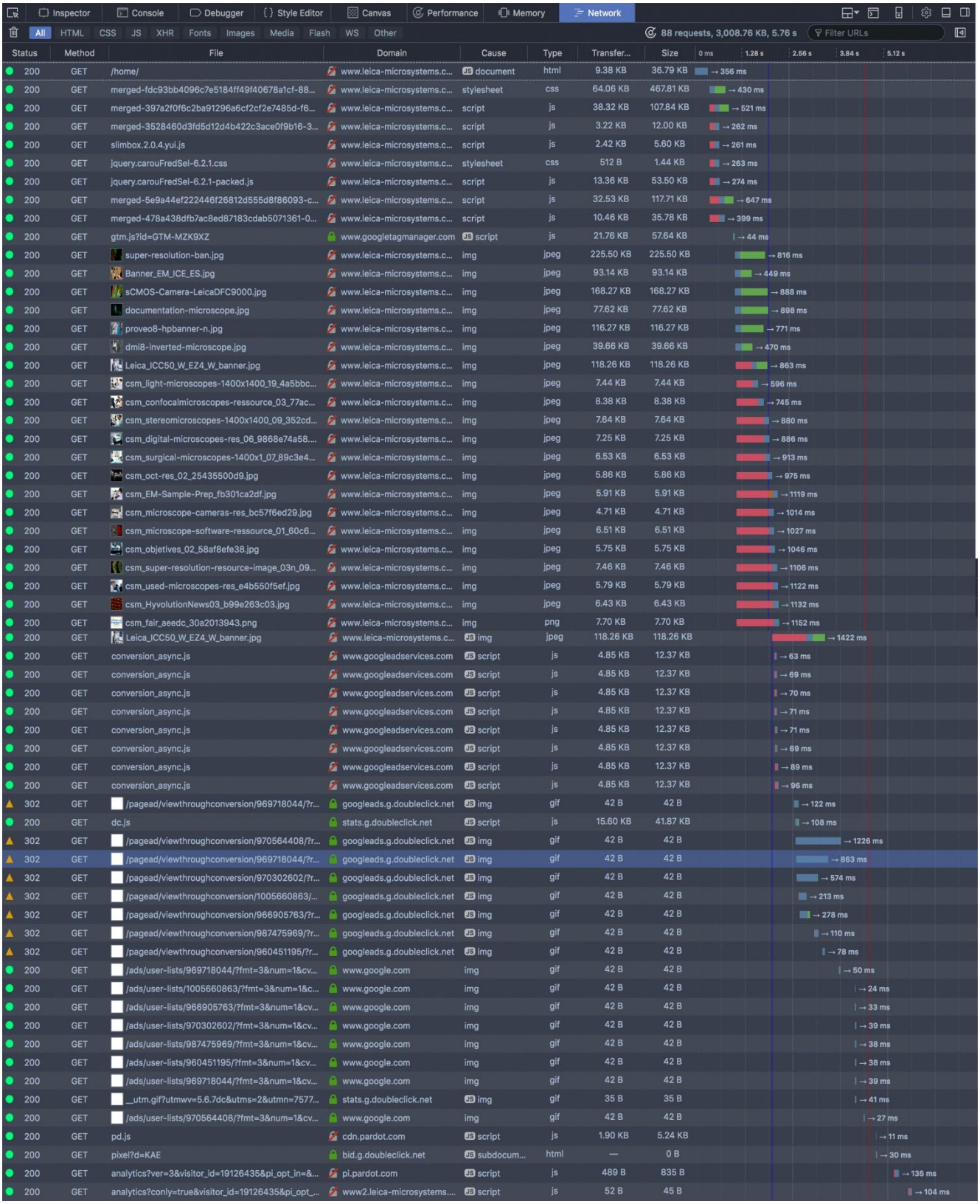


Further diagnoses was conducted.

Target: www.leica-microsystems.com

Analysis Method: Packet Tracking & Time Series Analysis

This analysis is based on data collected from Firefox by Mozilla™ (data is listed page 8). The browser request resource by HTTP/s from the source site of Leica Microsystems and the data returned is recorded. During the analysis, the HTTP Status, HTTP Method, HTTP header, source, type, size and time event are recorded and used to evaluate the performance of the website in order to develop a solution.


Inspector
Console
Debugger
Style Editor
Canvas
Performance
Memory
Network
All HTML CSS JS XHR Fonts Images Media Flash WS Other
88 requests, 3,008.76 KB, 5.76 s
Filter URLs
Status Method File Domain Cause Type Transfer... Size
0 ms 1.28 s 2.56 s 3.84 s 5.12 s
200 GET /home/ www.leica-microsystems.c... document html 9.38 KB 36.79 KB → 356 ms
200 GET merged-fdc93bb4096c7e5184ff49f40678a1cf-88... www.leica-microsystems.c... stylesheet css 64.06 KB 467.81 KB → 430 ms
200 GET merged-397a2f0f6c2ba91296a6cf2cf2e7485d-f6... www.leica-microsystems.c... script js 38.32 KB 107.84 KB → 521 ms
200 GET merged-3528460d3fd5d12d4b422c3ace0f9b16-3... www.leica-microsystems.c... script js 3.22 KB 12.00 KB → 262 ms
200 GET slimbox.2.0.4.yui.js www.leica-microsystems.c... script js 2.42 KB 5.60 KB → 261 ms
200 GET jquery.carouFredSel-6.2.1.css www.leica-microsystems.c... stylesheet css 512 B 1.44 KB → 263 ms
200 GET jquery.carouFredSel-6.2.1-packed.js www.leica-microsystems.c... script js 13.36 KB 53.50 KB → 274 ms
200 GET merged-5e9a44ef222446f26812d555d8f86093-c... www.leica-microsystems.c... script js 32.53 KB 117.71 KB → 647 ms
200 GET merged-478a438dfb7ac8ed87183cdab5071361-0... www.leica-microsystems.c... script js 10.46 KB 35.78 KB → 399 ms
200 GET gtm.js?id=GTM-MZK9XZ www.googletagmanager.com script js 21.76 KB 57.64 KB → 44 ms
200 GET super-resolution-ban.jpg www.leica-microsystems.c... img jpeg 225.50 KB 225.50 KB → 816 ms
200 GET Banner_EM_ICE_ES.jpg www.leica-microsystems.c... img jpeg 93.14 KB 93.14 KB → 449 ms
200 GET sCMOS-Camera-LeicaDFC9000.jpg www.leica-microsystems.c... img jpeg 168.27 KB 168.27 KB → 888 ms
200 GET documentation-microscope.jpg www.leica-microsystems.c... img jpeg 77.62 KB 77.62 KB → 898 ms
200 GET proveo8-hpbanner-n.jpg www.leica-microsystems.c... img jpeg 116.27 KB 116.27 KB → 771 ms
200 GET dmi8-inverted-microscope.jpg www.leica-microsystems.c... img jpeg 39.66 KB 39.66 KB → 470 ms
200 GET Leica_ICC50_W_EZ4_W_banner.jpg www.leica-microsystems.c... img jpeg 118.26 KB 118.26 KB → 863 ms
200 GET csm_light-microscopes-1400x1400_19_4a5bbc... www.leica-microsystems.c... img jpeg 7.44 KB 7.44 KB → 596 ms
200 GET csm_confocalmicroscopes-ressource_03_77ac... www.leica-microsystems.c... img jpeg 8.38 KB 8.38 KB → 745 ms
200 GET csm_stereomicroscopes-1400x1400_09_352cd... www.leica-microsystems.c... img jpeg 7.64 KB 7.64 KB → 880 ms
200 GET csm_digital-microscopes-res_06_9868e74a58.... www.leica-microsystems.c... img jpeg 7.25 KB 7.25 KB → 886 ms
200 GET csm_surgical-microscopes-1400x1_07_89c3e4... www.leica-microsystems.c... img jpeg 6.53 KB 6.53 KB → 913 ms
200 GET csm_oct-res_02_25435500d9.jpg www.leica-microsystems.c... img jpeg 5.86 KB 5.86 KB → 975 ms
200 GET csm_EM-Sample-Prep_fb301ca2df.jpg www.leica-microsystems.c... img jpeg 5.91 KB 5.91 KB → 1119 ms
200 GET csm_microscope-cameras-res_bc57f6ed29.jpg www.leica-microsystems.c... img jpeg 4.71 KB 4.71 KB → 1014 ms
200 GET csm_microscope-software-ressource_01_60c6... www.leica-microsystems.c... img jpeg 6.51 KB 6.51 KB → 1027 ms
200 GET csm_objetives_02_58af8efe38.jpg www.leica-microsystems.c... img jpeg 5.75 KB 5.75 KB → 1046 ms
200 GET csm_super-resolution-resource-image_03n_09... www.leica-microsystems.c... img jpeg 7.46 KB 7.46 KB → 1106 ms
200 GET csm_used-microscopes-res_e4b550f5ef.jpg www.leica-microsystems.c... img jpeg 5.79 KB 5.79 KB → 1122 ms
200 GET csm_HyvolutionNews03_b99e263c03.jpg www.leica-microsystems.c... img jpeg 6.43 KB 6.43 KB → 1132 ms
200 GET csm_fair_aeedc_30a2013943.png www.leica-microsystems.c... img png 7.70 KB 7.70 KB → 1152 ms
200 GET Leica_ICC50_W_EZ4_W_banner.jpg www.leica-microsystems.c... img jpeg 118.26 KB 118.26 KB → 1422 ms
200 GET conversion_async.js www.googleadservices.com script js 4.85 KB 12.37 KB → 63 ms
200 GET conversion_async.js www.googleadservices.com script js 4.85 KB 12.37 KB → 69 ms
200 GET conversion_async.js www.googleadservices.com script js 4.85 KB 12.37 KB → 70 ms
200 GET conversion_async.js www.googleadservices.com script js 4.85 KB 12.37 KB → 71 ms
200 GET conversion_async.js www.googleadservices.com script js 4.85 KB 12.37 KB → 71 ms
200 GET conversion_async.js www.googleadservices.com script js 4.85 KB 12.37 KB → 69 ms
200 GET conversion_async.js www.googleadservices.com script js 4.85 KB 12.37 KB → 89 ms
200 GET conversion_async.js www.googleadservices.com script js 4.85 KB 12.37 KB → 96 ms
302 GET /pagead/viewthroughconversion/969718044/?r... googleads.g.doubleclick.net img gif 42 B 42 B → 122 ms
200 GET dc.js stats.g.doubleclick.net script js 15.60 KB 41.87 KB → 108 ms
302 GET /pagead/viewthroughconversion/970564408/?r... googleads.g.doubleclick.net img gif 42 B 42 B → 1226 ms
302 GET /pagead/viewthroughconversion/969718044/?r... googleads.g.doubleclick.net img gif 42 B 42 B → 863 ms
302 GET /pagead/viewthroughconversion/970302602/?r... googleads.g.doubleclick.net img gif 42 B 42 B → 574 ms
302 GET /pagead/viewthroughconversion/1005660863/... googleads.g.doubleclick.net img gif 42 B 42 B → 213 ms
302 GET /pagead/viewthroughconversion/966905763/?r... googleads.g.doubleclick.net img gif 42 B 42 B → 278 ms
302 GET /pagead/viewthroughconversion/987475969/?r... googleads.g.doubleclick.net img gif 42 B 42 B → 110 ms
302 GET /pagead/viewthroughconversion/960451195/?r... googleads.g.doubleclick.net img gif 42 B 42 B → 78 ms
200 GET /ads/user-lists/969718044/?fmt=3&num=1&cv... www.google.com img gif 42 B 42 B → 50 ms
200 GET /ads/user-lists/1005660863/?fmt=3&num=1&c... www.google.com img gif 42 B 42 B → 24 ms
200 GET /ads/user-lists/966905763/?fmt=3&num=1&cv... www.google.com img gif 42 B 42 B → 33 ms
200 GET /ads/user-lists/970302602/?fmt=3&num=1&cv... www.google.com img gif 42 B 42 B → 39 ms
200 GET /ads/user-lists/987475969/?fmt=3&num=1&cv... www.google.com img gif 42 B 42 B → 38 ms
200 GET /ads/user-lists/960451195/?fmt=3&num=1&cv... www.google.com img gif 42 B 42 B → 38 ms
200 GET /ads/user-lists/969718044/?fmt=3&num=1&cv... www.google.com img gif 42 B 42 B → 39 ms
200 GET __utm.gif?utmwv=5.6.7dc&utms=2&utmn=7577... stats.g.doubleclick.net img gif 35 B 35 B → 41 ms
200 GET /ads/user-lists/970564408/?fmt=3&num=1&cv... www.google.com img gif 42 B 42 B → 27 ms
200 GET pd.js cdn.pardot.com script js 1.90 KB 5.24 KB → 11 ms
200 GET pixel?d=KAE bid.g.doubleclick.net subdocum... html — 0 B → 30 ms
200 GET analytics?ver=3&visitor_id=19126435&pi_opt_in=&... pi.pardot.com script js 489 B 835 B → 135 ms
200 GET analytics?conly=true&visitor_id=19126435&pi_opt_... www2.leica-microsystems.... script js 52 B 45 B → 104 ms

3.1 DATA SOURCE ANALYSIS

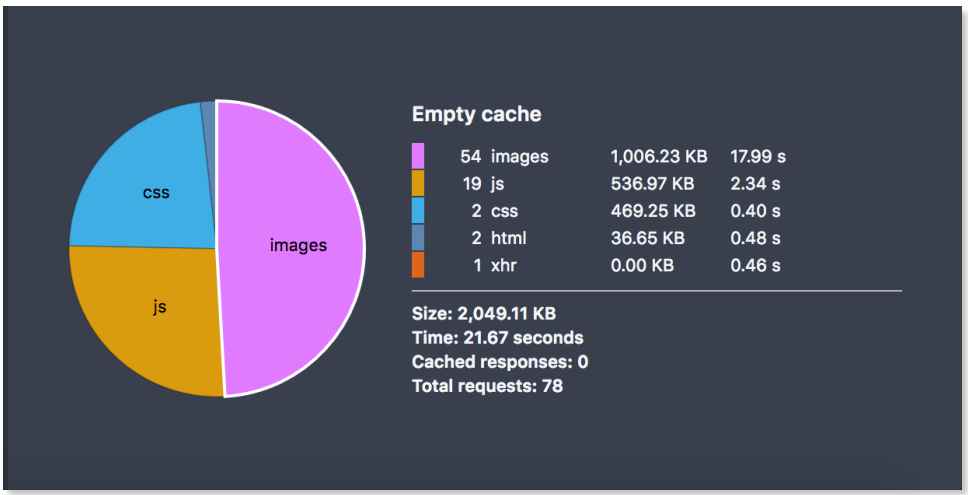
As the data shows, all the resources on Leica's website are from the following six domains:

1. leica-microsystems.com
2. googletagmanager.com BLOCKED in China
3. googleadservices.com BLOCKED in China
4. doubleclick.net BLOCKED in China
5. google.com BLOCKED in China
6. pardot.com

From the list above we can conclude that, including large amount of resources from the blocked third party website are the main reason of the long response time for the main site in China.

3.2 SERVER CACHE ANALYSIS

The cache analysis is conducted in a browser with an empty cache. The graph here below shows that the images are the main cause of the long response time in China. It takes approximately 18 seconds to load all the images and a total of up to 21.67 second to load all the contents.



3.3 COMPREHENSIVE ANALYSIS

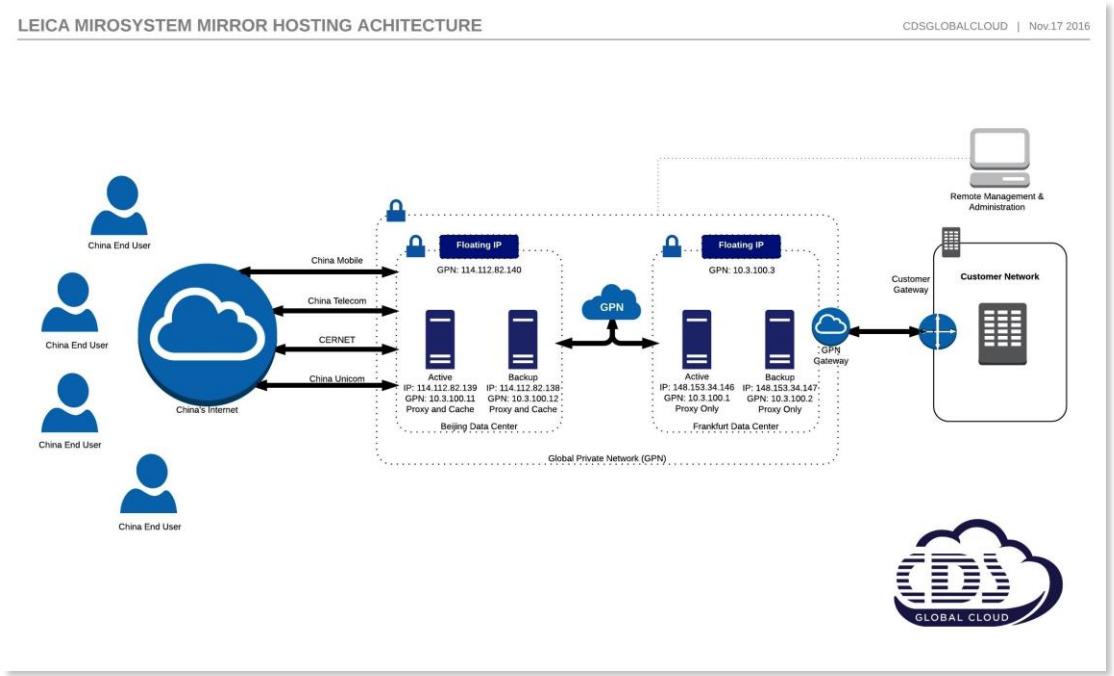
As stated above, the slow page load time is caused by the blocked third party websites and large HD graphics.

China's Great Firewall gateway works in the way that it keeps the connection on for the blocked content, but returns with nothing. Since the connectivity is still valid, the web browser, instead of skipping the blocked content and move on, keeps loading and never stops.

The transmission of this content is based on HTTP/TCP stack. By default, the TCP Window Scaling mechanism limits the startup transmission speed and are extremely sensitive to network quality. From the chart we can tell, it took more than 290ms for a round-trip delay time from China to Germany JUST to establish a TCP link!

Overall speaking, the poor network quality and long distance delay are the root causes of the instability of the Leica Microsystems website. Based on the conclusion, we designed and built the solution below to solve the problem.

4. CDS Solution



4.1General Architecture

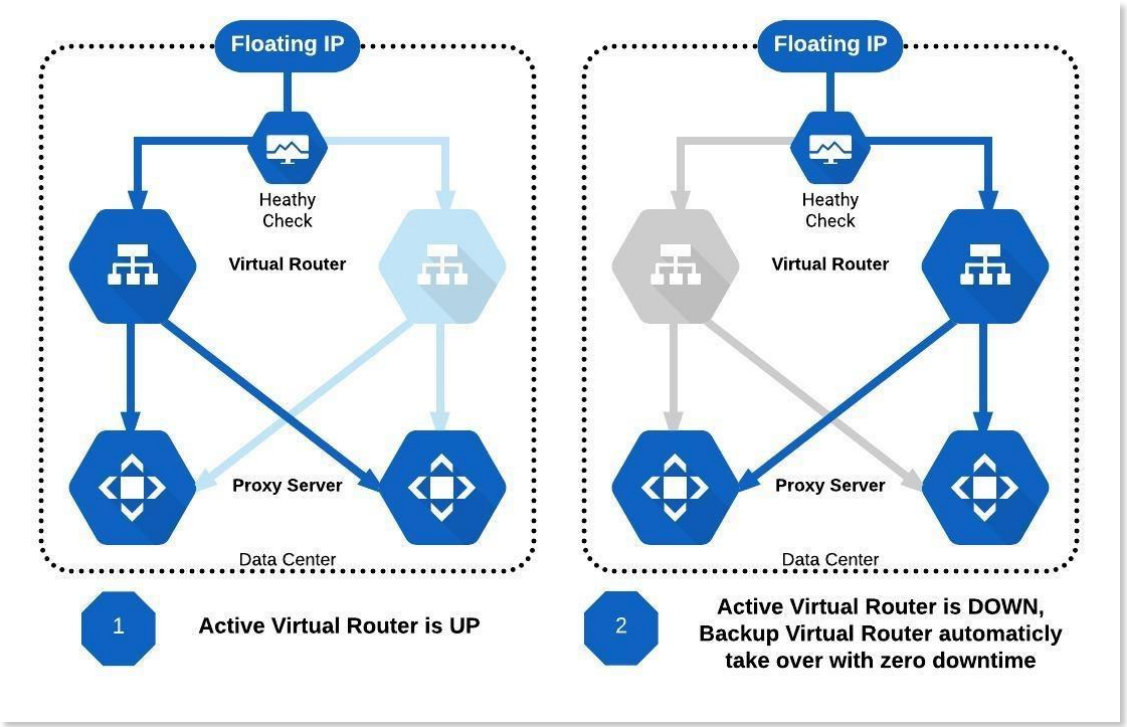
The proxy servers located in CDS' Frankfurt Data Center retrieve data from Leica Microsystems' origin web server (https://www.leica-microsystems.com/) and direct the traffic from Leica Microsystems' website into CDS' GPN. Then, the proxy/caching servers located in CDS' Beijing Data Center can retrieve and cache data from the CDS GPN directly.

The static data (pictures, CSS, javascript, etc.) is cached in Beijing Data Center and the dynamic data is transmitted to Leica Microsystems' origin server through CDS' GPN.

Users in China request data directly from CDS' Beijing Data Center. The cloud server returns all the cached data directly from Beijing, which shortens the page load time and reduces the down time of the website.

After testing, we concluded that the whole system as stated above is operational.

4.2 ACTIVE-BACKUP FAILOVER MODEL



Inside each data center, there are two server groups running in duplicate. This active-backup ensures high availability of the customer's website. The two server groups are managed by VRRP (Virtual Router Redundancy Protocol) and share one floating IP. If the active server is down, the backup server will assume the floating IP and continue the service.

As tested in debug mode, both the server groups are operational in Beijing and in the Frankfurt Data Center. If the active server is shutdown manually, the backup server will assume the floating IP automatically and continue service as stated in previous section, ensuring continued operation.

5. Pre-Launching Prove Of Concept

5.1 Security Tests

Security is one of our main concerns when deploying services for our customers. CDS Global Cloud makes every effort to protect our customers' data and ensure the performance of our services.

DATACENTER SECURITY

The data center is close to the city on the edge of the 6th ring road which facilitates maintenance to the machine room.

The location is not in an earthquake zone or flood disaster area and is considered a geographical safe zone.

The municipal supporting resources are abundant, suitable for the operation of a large-scale data center.

A smart video monitor system is active.

Intelligent access control system, magnetic card and biometric authentication are required for entrance.

Each cabinet is provided with an independent door lock

Professional security is on duty 7/24 hours.

SERVER SECURITY

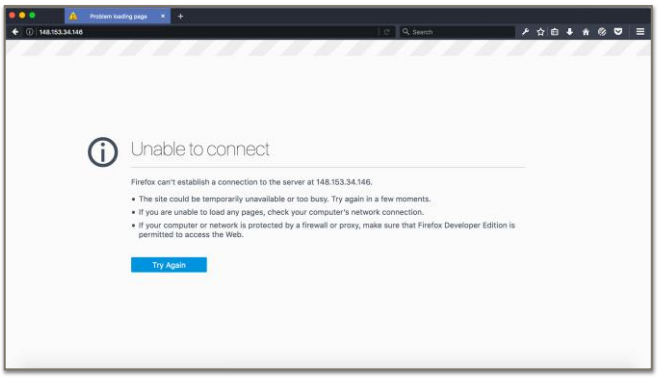
A cloud server is the basic unit providing the service and to better secure the server, firewalls are established in front of every cloud server deployed. The firewalls run in an application layer and filter all the segments traveling in and out the cloud servers.

Generally speaking, the firewall deployed only allows data though TCP port 80 (HTTP), TCP port 433 (HTTPs) and TCP port 22 (SSH) coming inside to the cloud server. TCP port 80 and 433 are reserved for web applications. To provide web services to end users, these two ports are required to remain open. TCP port 22 is for SSH connection and is opened for the necessary maintenance on the server.

After testing, all servers equipped with firewalls can only be accessed by HTTP/s and SSH.

APPLICATION/NETWORK SECURITY

Security policies are also deployed on service level.

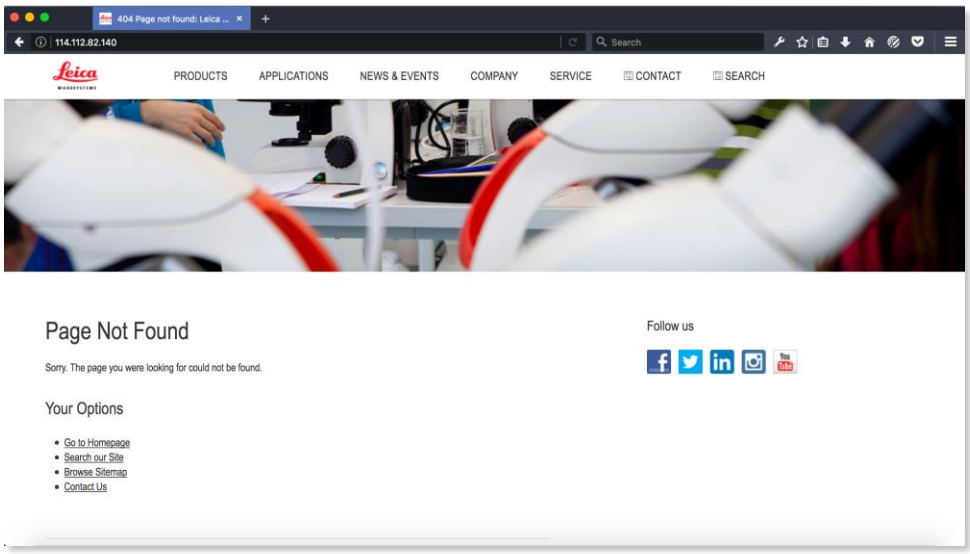


The proxy servers in the middle (Ex.: Frankfurt Data Center) are not exposed to the internet. and is not accessible directly from the IP address. This prevents the server from Man-in-Middle attack and ensures the content is not altered.

The proxy services in Frankfurt are not accessible to the internet and all data sent in and out of the Frankfurt Data Center is protected by transition via GPN — a private network accessible only by Leica Microsystems' cloud server located in CDS' data centers.

At the CDS' Beijing Data Center, the web services are provided to the public end-users. However, the web service is only accessible by Leica Microsystems' domain name (leica-microsystems.com and leica-microsystems.com.cn). Users trying to access the service though IP

addresses and other domain names will be receive a response in partial content and a HTTP 404



page.

5.2 Performance test — Time Based

The 24/7 performance test is carried out by Monitis™. The monitor sends one request per minute from China. From the test above we see that the down time of the origin site was 4 hours and the up time was only 83.5%. In comparison, CDS' mirror site had an up time of 99.8%.

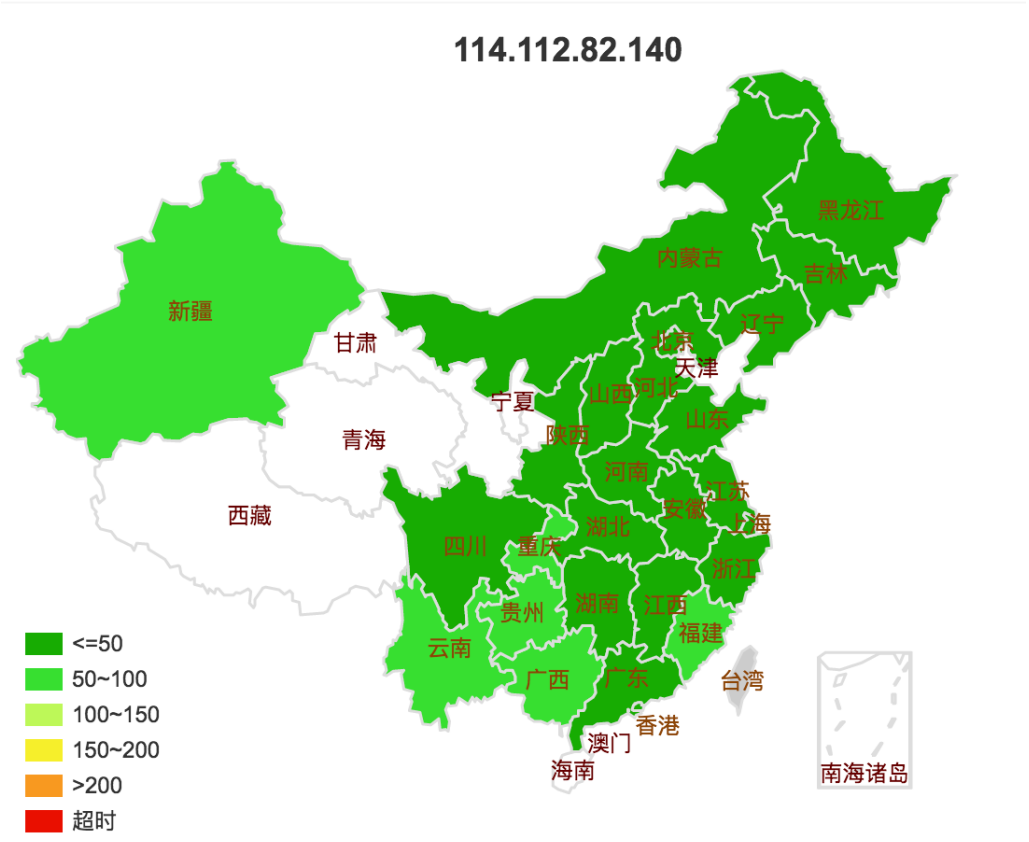
We can conclude that the CDS' proxy server would improve the customers' server's

uptime and enhance the end-user experience.

5.3 Performance test — Location Based

This test was carried out to test the CDS' proxy performance in different regions of China. Because the proxy server is located in CDS' Beijing Data Center, we need to be sure that it also has outstanding response time in the other regions of China.

From the graphic, the response time in the majority of China is less than 50ms and outlying regions is 50-100 ms. (See the detailed table on page 9 and 10.)



5.4 Performance test — Load (Concurrent) Test

In this test, there is 10 clients requesting the proxy server simultaneously during the 10 seconds period. The test host continues to send requests regardless of whether the previous requests have been answered. During this test, 1344 requests were sent in 10 seconds, all of which succeed.

This test showed that the CDS proxy server can handle thousands of request per 10

```
Webbench - Simple Web Benchmark 1.5
Copyright (c) Radim Kolar 1997-2004, GPL Open Source Software.

Benchmarking: GET http://leica-microsystems.com/ (using HTTP/1.1)
10 clients, running 30 sec, early socket close.

Speed=2688 pages/min, 0 bytes/sec.
Requests: 1344 susceed, 0 failed.
```

seconds.

Response Time from Different Provinces in China

No.	Monitor From (In English)	Monitor From (In Chinese)	Respons
1	HuBei	湖北随州[电信]	28r
2	HongKong	香港[电信]	40r
3	ShangHai	上海[电信]	31r
4	FuJian	福建福州[电信]	97r
5	ZheJiang	浙江绍兴[电信]	28r
6	JiangXi	江西新余[电信]	33r
7	JiangSu	江苏徐州[电信]	36r
8	LiaoNing	辽宁沈阳[电信]	21r
9	LiaoNing	辽宁大连[电信]	20r
10	GuangDong	广东佛山[电信]	37r
11	ChongQing	重庆[电信]	62r
12	GuangXi	广西南宁[电信]	48r
13	GuangDong	广东汕尾[电信]	41r
14	GuangXi	广西南宁[电信]	42r
15	HuNan	湖南长沙[电信]	76r
16	HuBei	湖北孝感[电信]	34r
17	GuiZhou	贵州兴义[电信]	29r
18	JiangSu	江苏泰州[电信]	73r
19	JiangSu	江苏扬州[电信]	25r
20	Beijing	北京[电信]	34r
21	GuangDong	广东惠州[电信]	4m
22	GuangDong	广东广州[电信]	36r
23	XinJiang	新疆哈密[电信]	38r
24	JiangSu	江苏常州[电信]	58r
25	AnHui	安徽合肥[电信]	33r
26	ShanXi	山西太原[电信]	26r
27	YunNan	云南昆明[电信]	16r
28	HuBei	湖北孝感[电信]	70r
29	ShanXi	陕西西安[电信]	27r
30	GuanDong	广东东莞[电信]	23r
31	JiangSu	江苏镇江[电信]	37r
32	FuJian	福建福州[电信]	36r

Response Time from Different Provinces in China- Cont.

No.	Monitor From (In English)	Monitor From (In Chinese)	Response Time
33	HuBei	湖北荆门[电信]	42ms53
34	FuJian	福建福州[电信]	28ms55
35	GuanDong	广东深圳[电信]	46ms52
36	ZheJiang	浙江绍兴[电信]	45ms51
37	ZheJiang	浙江温州[电信]	25ms53
38	HuBei	湖北仙桃市[电信]	31ms55
39	JiangSu	江苏镇江[电信]	81ms52
40	Inner Mongolia	内蒙古呼和浩特[电信]	30ms54
41	LiaoNing	辽宁沈阳[电信]	47ms52
42	HeNan	河南洛阳[多线]	19ms54
43	HeNan	河南洛阳[多线]	24ms55
44	ShangHai	上海[多线]	25ms49
45	GuanDong	广东茂名[多线]	45ms54
46	JiangXi	江西南昌[多线]	29ms53
47	ZheJiang	浙江绍兴[多线]	55ms54
48	Beijing	北京[联通]	3ms53
49	ShanXi	山西晋城[联通]	28ms53
50	FuJian	福建福州[联通]	107ms51
51	JiangSu	江苏宿迁[联通]	44ms51
52	JiangSu	江苏徐州[联通]	36ms53
53	JiLin	吉林延边[联通]	33ms51
54	XinJiang	新疆石河子[联通]	63ms52
55	GuangDong	广东深圳[联通]	49ms50
56	ShanDong	山东青岛[联通]	19ms51
57	HeBei	河北秦皇岛[联通]	11ms52
58	ShanXi	山西运城[联通]	22ms53
59	LiaoNing	辽宁大连[联通]	20ms52
60	HeNan	河南新乡[联通]	15ms51
61	HeiLongJiang	黑龙江哈尔滨[联通]	28ms51
62	HeiLongJiang	黑龙江哈尔滨[联通]	25ms52
63	FuJian	福建福州[移动]	49ms52
64	JiangXi	江西鹰潭[移动]	31ms51
65	ShanDong	山东枣庄[移动]	42ms50

6. Commercial Launch Review

Customer adopted Geo-DNS before cutting over to CDS proxy/Cache server.
CDS provided monitor report for global site performance for comparison.

Uptime Monitors

Monitoring Location: All **Apr 17, 2017 - Apr 23, 2017**

Monitor Name	Type	Uptime(%)[1]	Average Response Time (ms)[2]	Times Failed from All Locations(#)[3]
www.leica-microsystems.com	http	99.92	564.8	8

[1] **Uptime (%)** - If at least one location has returned OK, the All Locations result for the check is assigned OK status. Uptime (%) for a given time interval is calculated as the number of OKs divided over the number of checks.

[2] **Average Response Time (ms)** - For each check that has returned OK as the All Locations result, the smallest response time among all locations is determined. Average Response Time for a given time interval is calculated as average of the smallest response times across checks.

[3] **Times Failed from All Locations (#)** - For a given interval the number of times failure was returned by all locations during the check.

Monitoring Location: Japan

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	99.81	1381.34	18

Monitoring Location: US-MID2

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	99.67	881.13	33

Monitoring Location: China

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	99.84	615.93	15

Monitoring Location: US-EST

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	99.85	708.37	15

Monitoring Location: US-WST

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	99.86	987.8	14

Reference of Weekly Performance Before launching

Uptime Monitors

Monitoring Location: All Mar 06, 2017 - Mar 12, 2017

Monitor Name	Type	Uptime(%)[1]	Average Response Time (ms)[2]	Times Failed from All Locations(#)[3]
www.leica-microsystems.com	http	99.87	690.86	13

[1] **Uptime (%)** - If at least one location has returned OK, the All Locations result for the check is assigned OK status. Uptime (%) for a given time interval is calculated as the number of OKs divided over the number of checks.

[2] **Average Response Time (ms)** - For each check that has returned OK as the All Locations result, the smallest response time among all locations is determined. Average Response Time for a given time interval is calculated as average of the smallest response times across checks.

[3] **Times Failed from All Locations (#)** - For a given interval the number of times failure was returned by all locations during the check.

Monitoring Location: Japan

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	99.79	1385.22	21

Monitoring Location: US-MID2

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)

www.leica-microsystems.com	http	99.78	857.02	22

Monitoring Location: China

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	86.91	1946.05	1318

Monitoring Location: US-EST

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	99.83	685.8	16

Monitoring Location: US-WST

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	99.77	933.98	23

Reference of Monthly Performance Before launching

Uptime Monitors

Monitoring Location: All January, 2017

Monitor Name	Type	Uptime(%)[1]	Average Response Time (ms)[2]	Times Failed from All Locations(#)[3]
www.leica-microsystems.com	http	99.83	673.46	73

[1] **Uptime (%)** - If at least one location has returned OK, the All Locations result for the check is assigned OK status. Uptime (%) for a given time interval is calculated as the number of OKs divided over the number of checks.

[2] **Average Response Time (ms)** - For each check that has returned OK as the All Locations result, the smallest response time among all locations is determined. Average Response Time for a given time interval is calculated as average of the smallest response times across checks.

[3] **Times Failed from All Locations (#)** - For a given interval the number of times failure was returned by all locations during the check.

Monitoring Location: Japan

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	99.76	1373.45	105

Monitoring Location: US-MID2

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)

www.leica-microsystems.com	http	99.75	845.28	108

Monitoring Location: China

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	88.31	2369.29	5201

Monitoring Location: US-EST

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	99.76	664.13	104

Monitoring Location: US-WST

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	99.77	971.5	100

Uptime Monitors

Monitoring Location: All February, 2017

Monitor Name	Type	Uptime(%)[1]	Average Response Time (ms)[2]	Times Failed from All Locations(#)[3]
www.leica-microsystems.com	http	99.86	682.76	56

[1] **Uptime (%)** - If at least one location has returned OK, the All Locations result for the check is assigned OK status. Uptime (%) for a given time interval is calculated as the number of OKs divided over the number of checks.

[2] **Average Response Time (ms)** - For each check that has returned OK as the All Locations result, the smallest response time among all locations is determined. Average Response Time for a given time interval is calculated as average of the smallest response times across checks.

[3] **Times Failed from All Locations (#)** - For a given interval the number of times failure was returned by all locations during the check.

Monitoring Location: Japan

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	99.71	1385	114

Monitoring Location: US-MID2

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	99.71	847.08	115

Monitoring Location: China

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	87.59	2107.98	4999

Monitoring Location: US-EST

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	99.76	671.5	94

Monitoring Location: US-WST

Monitor Name	Type	Uptime(%)	Average Response Time (ms)	Failures(#)
www.leica-microsystems.com	http	99.74	961.93	102

Conclusion, CDS Mirror Hosting project improved the customer's web performance in China by 80% in term of page load time. Proven performance comparable to global user experience.

If you are interested in this solution for your company, please contact CDS Global Cloud at sales@cdsglobalcloud.com