

Lost in Translation: varnishlog, varnishtest

~The Story of a Successful Migration~

GREE, inc.
Shohei Tanaka

Varnish User Group Meeting 7
Friday, May 31st 2013

Who am I

Shohei Tanaka (@xcir)

- Call me iwana-chan
- GREE, inc.
 - Joined 2013/01~
 - Tokyo, Japan
- Activities at varnish project
 - VMOD author
 - Idap, redirect, parsereq, awsrest and more..
 - Wrote Japanese Varnish guidebook
- Other
 - blog <http://blog.xcir.net/>

github <http://github.com/xcir/>

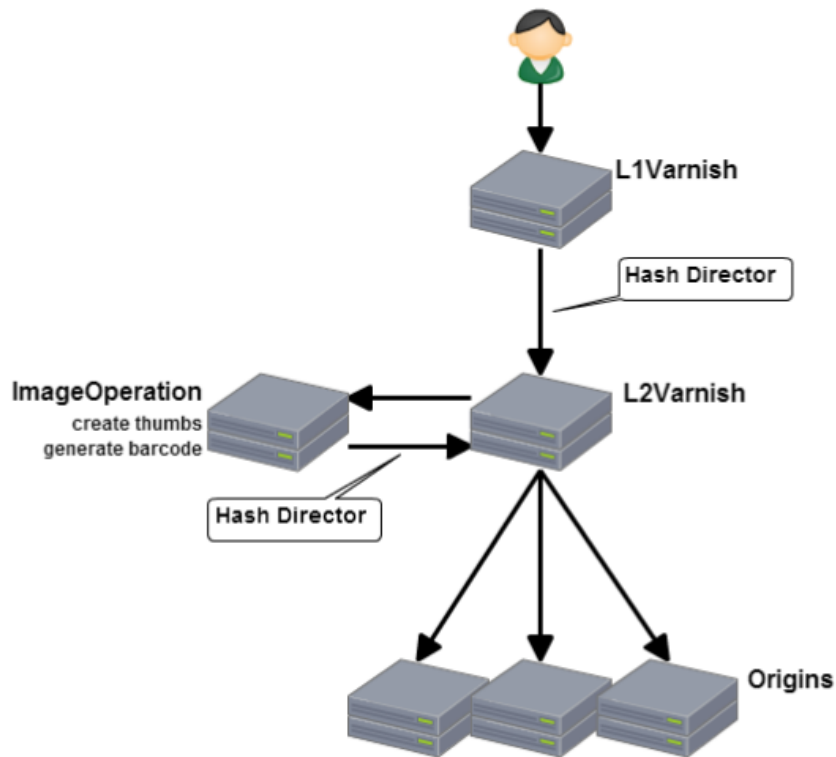
Migration from legacy system

Finished without any downtime

- Platform downtime was not an option
- Domain / backend has more than a hundred columns
- Very high
 - Traffic
 - Connection/sec
 - Request/sec
- Many target device types
 - PC
 - Smartphone
 - Mobile phone (No support for keep-alive)

New system

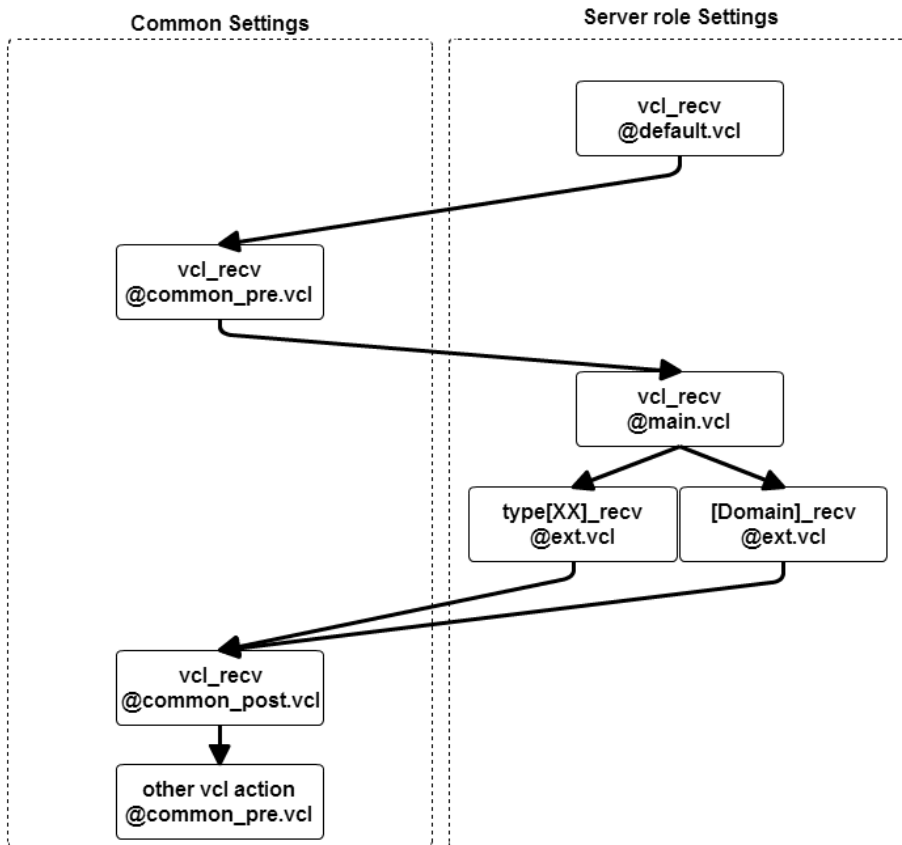
Server layout



- 3 layer model
- Use Hash director
 - Objects won't be duplicated across L2 pool
- ImageOperation
 - Apache + Varnish
 - Create thumbs
 - mod_small_light
 - Generate barcode(QR)

New system

VCL layout



- Common settings
 - Same for all server roles
 - Security, ACL, Normalize....
- Individual server role settings
 - Backend, Rewrite...
 - Divide action by
 - Type (categorized domain)
 - Domain (can't categorize)

Why Varnish?

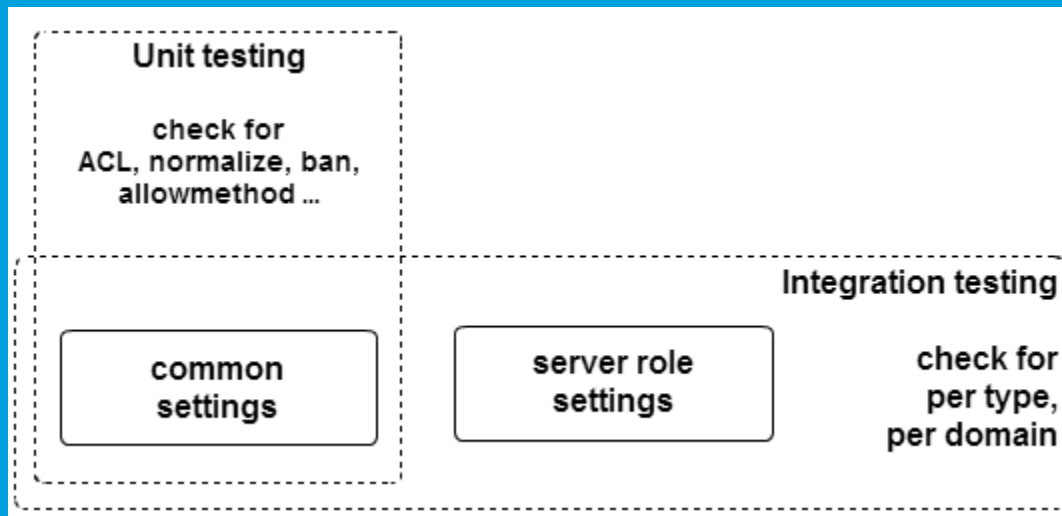
GREE had never used it

- VCL
 - Very powerful DSL
 - Fits into existing system
- Healthcheck
- Varnishtest
 - Can define the behavior of the server, client, varnish.
- Useful tools
 - varnishncsa and varnishlog are very useful
 - libvarnishapi can connect to VSL easily
- And I love Varnish ;-)

Testing, Testing, Testing!

We used varnishtest

- Different package for common and server roles
- Unit tests for common settings
- Integration tests for common + server role



varnishtest(failed log)

I love it, but it's difficult to read

```
**** c1      0.4 rxhdr| \r\n
**** c1      0.4 http[ 0] | HTTP/1.1
**** c1      0.4 http[ 1] | 200
**** c1      0.4 http[ 2] | Ok
**** c1      0.4 http[ 3] | Content-Length: 3
**** c1      0.4 http[ 4] | Accept-Ranges: bytes
**** c1      0.4 http[ 5] | Date: Sun, 28 Apr 2013 15:26:36 GMT
**** c1      0.4 http[ 6] | X-Varnish: 1001
**** c1      0.4 http[ 7] | Age: 0
**** c1      0.4 http[ 8] | Via: 1.1 varnish
**** c1      0.4 http[ 9] | Connection: keep-alive
**** c1      0.4 body| .\n
**** c1      0.4 body| .
**** c1      0.4 bodylen = 3
***  c1      0.4 expect
---- c1      0.4 EXPECT resp.status (200) == 400 (400) failed
*   top     0.4 RESETTING after test.vtc
**  s1      0.4 Waiting for server
**** s1      0.4 macro undef s1_addr
**** s1      0.4 macro undef s1_port
**** s1      0.4 macro undef s1_sock
**** v1      0.4 vs1|      0 CLI      - Rd debug.listen_address
**** v1      0.4 vs1|      0 CLI      - Wr 200 16 127.0.0.1 49619
```


varnishtest(failed log)

I love it, but it's difficult to read

```
**** c1 0.4 rxhdr| \r\n
**** c1 0.4 http[ 0] | HTTP/1.1
**** c1 0.4 http[ 1] | 200
**** c1 0.4 http[ 2] | Ok
**** c1 0.4 http[ 3] | Content-Length: 3
**** c1 0.4 http[ 4] | Accept-Ranges: bytes
**** c1 0.4 http[ 5] | Date: Sun, 28 Apr 2013 15:26:36 GMT
**** c1 0.4 http[ 6] | X-Varnish: 1001
**** c1 0.4 http[ 7] | Age: 0
**** c1 0.4 http[ 8] | Via: 1.1 varnish
**** c1 0.4 http[ 9] | Connection: keep-alive
**** c1 0.4 body| \n
**** c1 0.4 body| .
**** c1 0.4 bodylen = 3
*** c1 0.4 expect
---- c1 0.4 EXPECT resp.status (200) == 400 (400) failed
* top 0.4 RESETING after test.vtc
** s1 0.4 Waiting for server
**** s1 0.4 macro undef s1_addr
**** s1 0.4 macro undef s1_port
**** s1 0.4 macro undef s1_sock
**** v1 0.4 vs1| 0 CLI - Rd debug.listen_address
**** v1 0.4 vs1| 0 CLI - Wr 200 16 127.0.0.1 49619
```

Human readable ;)

- Sort by
 - Event
 - Error output
 - Header and expected result
 - Macro define

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Screenshot

Event

vtctrans

```
<<<< Start child process v1 >>>>
** v1 0.2 Start
**** v1 0.2 CLI TX| start
*** v1 0.2 debug| child (5257) Started\n
**** v1 0.2 vsi| 0 WorkThread - 0x7ffd734efa90 start
**** v1 0.2 vsi| 0 CLI - Rd vcl.load "vcl1" ./vcl.43rv689Q.so
**** v1 0.2 vsi| 0 CLI - Wr 200 36 Loaded "./vcl.43rv689Q.so" as "vcl1"
**** v1 0.2 vsi| 0 CLI - Rd vcl.use "vcl1"
**** v1 0.2 vsi| 0 CLI - Wr 200 0
**** v1 0.2 vsi| 0 CLI - Rd start
*** v1 0.2 CLI RX 200

<<<< Wait running v1 >>>>
*** v1 0.2 wait-running
**** v1 0.2 CLI TX| status
*** v1 0.2 debug| Child (5257) said Child starts\n
*** v1 0.2 debug| Child (5257) said SMF.s0 mmap'ed 10485760 bytes of 10485760\n
**** v1 0.2 vsi| 0 Debug - Acceptor is epoll
```

varnishtest

```
**** v1 0.2 CLI RX| VCL compiled.
**** v1 0.2 CLI TX| vcl.use vcl1
*** v1 0.2 CLI RX 200
** v1 0.2 Start
**** v1 0.2 CLI TX| start
*** v1 0.2 debug| child (23936) Started\n
*** v1 0.2 CLI RX 200
*** v1 0.2 wait-running
**** v1 0.2 CLI TX| status
*** v1 0.2 debug| Child (23936) said Child starts\n
*** v1 0.2 debug| Child (23936) said SMF.s0 mmap'ed 10485760 bytes of 10485760\n
**** v1 0.2 vsi| 0 WorkThread - 0x7f408bee9fa90 start
```

Screenshot

Event

vtctrans

```
<<<< Start child process v1 >>>>
*** v1 0.2 Start
**** v1 0.2 CLI TX| start
*** v1 0.2 debug| child (5257) Started\n
**** v1 0.2 vsl| 0 WorkThread - 0x7ffd734efa90 start
**** v1 0.2 vsl| 0 CLI - Rd vcl.load "vcl1" ./vcl.43rv689Q.so
**** v1 0.2 vsl| 0 CLI - Wr 200 36 Loaded "./vcl.43rv689Q.so" as "vcl1"
**** v1 0.2 vsl| 0 CLI - Rd vcl.use "vcl1"
**** v1 0.2 vsl| 0 CLI - Wr 200 0
**** v1 0.2 vsl| 0 CLI - Rd start
*** v1 0.2 CLI RX 200

<<<< Wait running v1 >>>>
*** v1 0.2 wait-running
**** v1 0.2 CLI TX| status
*** v1 0.2 debug| Child (5257) said Child starts\n
*** v1 0.2 debug| Child (5257) said SMF.s0 mmap'ed 10485760 bytes of 10485760\n
**** v1 0.2 vsl| 0 Debug - Acceptor is open
```

varnishtest

```
**** v1 0.2 CLI RX| VCL compiled.
**** v1 0.2 CLI TX| vcl.use vcl1
*** v1 0.2 CLI RX 200
*** v1 0.2 Start
**** v1 0.2 CLI TX| start
*** v1 0.2 debug| child (23936) Started\n
*** v1 0.2 CLI RX 200
*** v1 0.2 wait-running
**** v1 0.2 CLI TX| status
*** v1 0.2 debug| Child (23936) said Child starts\n
*** v1 0.2 debug| Child (23936) said SMF.s0 mmap'ed 10485760 bytes of 10485760\n
**** v1 0.2 vsl| 0 WorkThread - 0x7f408bcefa90 start
```

Screenshot

Macro list

Macro list		vtctrans
[key]	[value]	
varnishd	varnishd	
s1_port	47513	
s1_addr	127.0.0.1	
v1_port	39973	
v1_addr	127.0.0.1	
s1_sock	127.0.0.1 47513	
bad_ip	10.255.255.255	
pwd	/root/git/vtctrans	
topbuild	/root/git/vtctrans/../../	
v1_sock	127.0.0.1 39973	
tmpdir	/tmp/vtc.5195.12f9e79f	

```
*** v1 0.4 CLI RX 200
**** v1 0.4 CLI RX| 127.0.0.1 56395\n
** v1 0.4 Listen on 127.0.0.1 56395
**** v1 0.4 macro def v1_addr=127.0.0.1
**** v1 0.4 macro def v1_port=56395
**** v1 0.4 macro def v1_sock=127.0.0.1 56395
*** top 0.4 shell
**** top 0.4 shell| /bin/echo hoge
*** top 0.4 client
```

varnishtest

Screenshot

Macro list

```
#####  
Macro list  
-----  
[key] | [value]  
-----  
varnishd | varnishd  
sl_port | 47513  
sl_addr | 127.0.0.1  
vl_port | 39973  
vl_addr | 127.0.0.1  
sl_sock | 127.0.0.1 47513  
bad_ip | 10.255.255.255  
pwd | /root/git/vtctrans  
topbuild | /root/git/vtctrans/../../  
vl_sock | 127.0.0.1 39973  
tmpdir | /tmp/vtc.5195.12f9e79f
```

vtctrans

```
*** v1 0.4 CLI RX 200  
**** v1 0.4 CLI RX| 127.0.0.1 56395\n  
** v1 0.4 Listen on 127.0.0.1 56395  
**** v1 0.4 macro def vl_addr=127.0.0.1  
**** v1 0.4 macro def vl_port=56395  
**** v1 0.4 macro def vl_sock=127.0.0.1 56395  
*** top 0.4 shell  
**** top 0.4 shell| /bin/echo hoge  
*** top 0.4 client
```

varnishtest

Screenshot

Header and expected result

vtctrans

```
#####  
Expect list
```

```
c1 expect (f8047785c53d48a1410811731457ee85)
```

```
-----  
HTTP:header  
-----  
HTTP/1.1  
200  
Ok  
Content-Length: 3  
Accept-Ranges: bytes  
Date: Sat, 18 May 2013 08:33:11 GMT  
X-Varnish: 1001  
Age: 0  
Via: 1.1 varnish  
Connection: keep-alive
```

```
-----  
HTTP:body  
-----  
.\n
```

```
-----  
HTTP:bodylen  
-----  
3
```

```
-----  
EXPECT[0]  
EXPECT[0]:expr resp.body == .<RETURN>.  
EXPECT[0]:val .<RETURN>. == .<RETURN>.  
EXPECT[0]:result match  
-----  
EXPECT[1]  
EXPECT[1]:expr resp.status == 400  
EXPECT[1]:val 200 == 400  
EXPECT[1]:result failed  
-----
```

varnishtest

```
#####  
0.4 rxhdr | Via: 1.1 varnish  
**** c1 0.4 rxhdr | Connection: keep  
**** c1 0.4 rxhdr | \r\n  
**** c1 0.4 http[ 0] | HTTP/1.1  
**** c1 0.4 http[ 1] | 200  
**** c1 0.4 http[ 2] | Ok  
**** c1 0.4 http[ 3] | Content-Length: 3  
**** c1 0.4 http[ 4] | Accept-Ranges: bytes  
**** c1 0.4 http[ 5] | Date: Sat, 18 May 2013 08:33:42 GMT  
**** c1 0.4 http[ 6] | X-Varnish: 1001  
**** c1 0.4 http[ 7] | Age: 0  
**** c1 0.4 http[ 8] | Via: 1.1 varnish  
**** c1 0.4 http[ 9] | Connection: keep-alive  
**** c1 0.4 body | .\n  
**** c1 0.4 body | .  
**** c1 0.4 bodylen = 3  
**** c1 0.4 expect  
**** c1 0.4 EXPECT resp.body (.  
. ) == .  
. (.  
. ) match  
**** c1 0.4 expect  
---- c1 0.4 EXPECT resp.status (200) == 400 (400) failed  
* top 0.4 RESETTING after test.vtc  
** s1 0.4 Waiting for server  
**** s1 0.4 macro undef s1_addr
```

Screenshot

Header and expected result

vtctrans

```
#####
Expect list
-----
c1 expect (f8047785c53d48a1410811731457ee85)
-----
HTTP:header
-----
HTTP/1.1
200
Ok
Content-Length: 3
Accept-Ranges: bytes
Date: Sat, 18 May 2013 08:33:11 GMT
X-Varnish: 1001
Age: 0
Via: 1.1 varnish
Connection: keep-alive
-----
HTTP:body
-----
.\n
-----
HTTP:bodylen
-----
3
-----
EXPECT[0]
EXPECT[0]:expr  resp.body == .<RETURN>.
EXPECT[0]:val   .<RETURN>. == .<RETURN>.
EXPECT[0]:result match
-----
EXPECT[1]
EXPECT[1]:expr  resp.status == 400
EXPECT[1]:val   200 == 400
EXPECT[1]:result failed
-----
```

varnishtest

```
#####
c1 0.4 rxhdr | Via: 1.1 varnish
**** c1 0.4 rxhdr | Connection: keep-alive
**** c1 0.4 rxhdr | \r\n
**** c1 0.4 http[ 0] | HTTP/1.1
**** c1 0.4 http[ 1] | 200
**** c1 0.4 http[ 2] | Ok
**** c1 0.4 http[ 3] | Content-Length: 3
**** c1 0.4 http[ 4] | Accept-Ranges: bytes
**** c1 0.4 http[ 5] | Date: Sat, 18 May 2013 08:33:42 GMT
**** c1 0.4 http[ 6] | X-Varnish: 1001
**** c1 0.4 http[ 7] | Age: 0
**** c1 0.4 http[ 8] | Via: 1.1 varnish
**** c1 0.4 http[ 9] | Connection: keep-alive
**** c1 0.4 body | .\n
**** c1 0.4 body | .
**** c1 0.4 bodylen = 3
**** c1 0.4 expect
**** c1 0.4 EXPECT resp.body (.
.) == .
. (
.) match
**** c1 0.4 expect
---- c1 0.4 EXPECT resp.status (200) == 400 (400) failed
* top 0.4 RESETTING after test.vtc
** s1 0.4 Waiting for server
**** s1 0.4 macro undef s1_addr
#####
```


Performance tuning

Measure, don't guess

- Nevertheless, capacity planning is important :)
 - runtime parameters
 - server specs, placement
 - fault tolerance (keep service up even when a rack fails)
- Measure with production servers, it's the most important thing
- Useful commands
 - `varnishncsa -m "txstatus:^[45]"`
 - `varnishstat`
 - `varnishhist -m "rxheader:Host: foo"`
 - `varnishlog -m "rxurl:/foo/bar"`

Use `varnishncsa` and `varnishlog` and

varnishlog

ugly

```
4 RxHeader      c Accept: */*
4 RxHeader      c Host: 192.168.1.199:6081
4 RxHeader      c Connection: Keep-Alive
4 Debug         c thr 0x7f8c025f0700 STP_RECV sp 0x7f8c08ddf008 obj (nil) vcl 0x7f8c08d05228
4 VCL_call      c recv 1 65.1 3 71.1 lookup
4 VCL_call      c hash 36 85.5
4 Hash          c /
4 VCL_trace     c 37 87.9
4 Hash          c 192.168.1.199:6081
4 VCL_return    c hash
4 Debug         c thr 0x7f8c025f0700 STP_LOOKUP sp 0x7f8c08ddf008 obj (nil) vcl 0x7f8c08d05228
4 Hit           c 1462026974
4 Debug         c thr 0x7f8c025f0700 STP_HIT sp 0x7f8c08ddf008 obj 0x7f8bf30fd000 vcl 0x7f8c08d05228
4 VCL_call      c hit 6 133.1 8 138.1 deliver
4 Debug         c thr 0x7f8c025f0700 STP_PREPRESP sp 0x7f8c08ddf008 obj 0x7f8bf30fd000 vcl 0x7f8c08d05228
4 VCL_call      c deliver 18 196.1 19 210.1 20 212.1 22 243.1 44 116.5 deliver
4 Debug         c thr 0x7f8c025f0700 STP_DELIVER sp 0x7f8c08ddf008 obj 0x7f8bf30fd000 vcl 0x7f8c08d05228
4 TxProtocol    c HTTP/1.1
4 TxStatus      c 200
4 TxResponse    c abc
4 TxHeader      c Server: Apache/2.2.15 (Scientific Linux)
4 TxHeader      c Content-Type: text/html; charset=UTF-8
4 TxHeader      c Content-Length: 3822
4 TxHeader      c Accept-Ranges: bytes
4 TxHeader      c Date: Fri, 13 Jan 2012 10:41:23 GMT
4 TxHeader      c X-Varnish: 1462026975 1462026974
4 TxHeader      c Age: 9
4 TxHeader      c Via: 1.1 varnish
4 TxHeader      c Connection: keep-alive
4 TxHeader      c str2: abcaaa
```

vsltrans.py(old:vltrans.php)

beautiful!

```

Action information.
-----
+-----+
| recv   |
+-----+
| VCL_trace | (VRT_Count:1 line:18 pos:1)
| VCL_Log   | hogejojfdls
| VCL_trace | (VRT_Count:5 line:41 pos:5)
| VCL_trace | (VRT_Count:6 line:42 pos:9)
| VCL_trace | (VRT_Count:8 line:46 pos:13)
| VCL_trace | (VRT_Count:9 line:49 pos:5)
| VCL_trace | (VRT_Count:11 line:59 pos:5)
| VCL_trace | (VRT_Count:13 line:63 pos:5)
| VCL_trace | (VRT_Count:15 line:67 pos:5)
| return   | lookup
+-----+
+-----+
| hash    |
+-----+
| VCL_trace | (VRT_Count:2 line:94 pos:1)
| Hash      | bar
| VCL_trace | (VRT_Count:18 line:85 pos:5)
| Hash      | /esi.html
| VCL_trace | (VRT_Count:19 line:87 pos:9)
| Hash      | 192.168.1.199:8081
| return    | hash
+-----+
+-----+
| miss    |
+-----+
| VCL_trace | (VRT_Count:22 line:99 pos:5)
| TTL       | src=VCL ttl=0 grace=-1 keep=-1 Reference time for TTL=2013-05-05 05:30:42
| return    | fetch
+-----+
+-----+
| fetch   |
+-----+
| VCL_trace | (VRT_Count:3 line:41 pos:9)
| VCL_trace | (VRT_Count:23 line:103 pos:5)
| VCL_trace | (VRT_Count:24 line:109 pos:17)
| TTL       | src=VCL ttl=120 grace=-1 keep=-1 Reference time for TTL=2013-05-05 05:30:42
| return    | hit_for_pass
+-----+
+-----+
| deliver |
+-----+
| VCL_trace | (VRT_Count:4 line:45 pos:9)
| VCL_trace | (VRT_Count:26 line:116 pos:5)

```

- Sort by
 - Error output
 - VCL action
 - variable
 - hash and vary
- can use multiple -m option

<https://github.com/xcir/vsltrans>

Screenshot

General, Error, Hash, Vary info

vsltrans

varnishlog

```
START transaction.
General Info.
-----
Client ip:port | 192.168.1.199:43051
Request host   | 192.168.1.199
Response size  | 158 byte
Response Status | HTTP/1.1 200 OK
Total time     | 0.00684 sec
Restart count  | 0
ESI count      | 2
Backend count  | 3
+Backend       | default
+Backend       | default
+Backend       | default
-----
Object information.
-----
Hash          | "bar" + "/esi.html" + "192.168.1.199:6081"
Vary           | req.http.User-Agent | Wget/1.12 (linux-gnu)
Object size    | 158
Backend       | default
-----
Error information.
-----
ESI_xmlerror | WARN at 53 ESI 1.0 <esi:include> lacks final '/'
ESI_xmlerror | WARN at 85 ESI 1.0 <esi:include> lacks final '/'
```

```
93 12 RxProtocol c HTTP/1.0
94 12 RxHeader   c User-Agent: Wget/1.12 (linux-gnu)
95 12 RxHeader   c Accept: */*
96 12 RxHeader   c Host: 192.168.1.199:6081
97 12 RxHeader   c Connection: Keep-Alive
98 12 VCL_return  c hash
99 12 VCL_call    c hash 2 34.1
100 12 Hash        c bar
101 12 VCL_trace   c 18 85.5
102 12 Hash        c /esi.html
103 12 VCL_trace   c 19 87.9
104 12 Hash        c 192.168.1.199:6081
105 12 VCL_return  c hash
106 12 VCL_call    c miss 22 99.5 fetch
107 12 ObjHeader   c Server: Apache/2.2.15 (Ubuntu)
108 12 ObjHeader   c Accept-Ranges: bytes
109 12 ObjHeader   c X-Mod-Pagespeed: 1.2.24.1-2581
110 12 ObjHeader   c Vary: User-Agent
111 12 ObjHeader   c Content-Encoding: gzip
112 12 ObjHeader   c Cache-Control: max-age=0, no-cache
113 12 ObjHeader   c Content-Type: text/html; charset=UTF-8
114 12 ESI_xmlerror c WARN at 53 ESI 1.0 <esi:include> lacks final '/'
115 12 ESI_xmlerror c WARN at 85 ESI 1.0 <esi:include> lacks final '/'
116 12 Gzip         c U F E 87 102 80 80 628
117 12 Gzip         c G F E 102 158 80 1184 1194
118 12 Gzip         c G F E 32 59 80 392 402
119 12 VCL_call    c deliver 4 45.9 26 116.5 deliver
120 12 Gzip         c U D - 59 32 80 392 402
121 12 Gzip         c U D E 78 50 80 0 0
122 12 Length      c 64
123 12 ReqEnd      c 2088372858 1367731842.320536137 1367731842.3273754
124 12 SessionClose c EOF mode
```

and more...

Screenshot

General, Error, Hash, Vary info

vsltrans

varnishlog

```
START transaction.
General Info.
-----
Client ip:port | 192.168.1.199:43051
Request host   | 192.168.1.199
Response size  | 158 byte
Response Status | HTTP/1.1 200 OK
Total time     | 0.00684 sec
Restart count  | 0
ESI count      | 2
Backend count  | 3
+Backend       | default
+Backend       | default
+Backend       | default
-----
Object information.
-----
Hash | "bar" + "/esi.html" + "192.168.1.199:6081"
-----
Vary | req.http.User-Agent | Wget/1.12 (linux-gnu)
Object size | 158
Backend    | default
-----
Error information.
-----
ESI_xmlerror | WARN at 53 ESI 1.0 <esi:include> lacks final '/'
ESI_xmlerror | WARN at 85 ESI 1.0 <esi:include> lacks final '/'
```

```
93 12 RxProtocol c HTTP/1.0
94 12 RxHeader c User-Agent: Wget/1.12 (linux-gnu)
95 12 RxHeader c Accept: */*
96 12 RxHeader c Host: 192.168.1.199:6081
97 12 RxHeader c Connection: Keep-Alive
98 12 VCL_return c lookup
99 12 VCL_call c hash 2 34.1
100 12 Hash c bar
101 12 VCL_trace c 18.85.5
102 12 Hash c /esi.html
103 12 VCL_trace c 19.87.9
104 12 Hash c 192.168.1.199:6081
105 12 VCL_return c hash
106 12 VCL_call c miss 22 99.5 fetch
107 12 ObjHeader c Server: Apache/2.2.15 (Ubuntu)
108 12 ObjHeader c Accept-Ranges: bytes
109 12 ObjHeader c X-Mod-Pagespeed: 1.2.24.1-2581
110 12 ObjHeader c Vary: User-Agent
111 12 ObjHeader c Content-Encoding: gzip
112 12 ObjHeader c Cache-Control: max-age=0, no-cache
113 12 ObjHeader c Content-type: text/html; charset=UTF-8
114 12 ESI_xmlerror c WARN at 53 ESI 1.0 <esi:include> lacks final '/'
115 12 ESI_xmlerror c WARN at 85 ESI 1.0 <esi:include> lacks final '/'
116 12 Gzip c U F E 87 102 80 80 628
117 12 Gzip c G F E 102 158 80 1184 1194
118 12 Gzip c G F E 32 59 80 392 402
119 12 VCL_call c deliver 4 45.9 26 116.5 deliver
120 12 Gzip c U D - 59 32 80 392 402
121 12 Gzip c U D E 78 50 80 0 0
122 12 Length c 64
123 12 ReqEnd c 2088372858 1367731842.320536137 1367731842.3273754
124 12 SessionFlush c EOF mode
```

and more...

Screenshot

Action

```
#####
Action information.
-----
+-----+
|   recv   |
+-----+
|
| VCL_trace | (VRT_Count:1 line:16 pos:1)
| VCL_Log    | hogejojfdls
| VCL_trace  | (VRT_Count:5 line:41 pos:5)
| VCL_trace  | (VRT_Count:6 line:42 pos:9)
| VCL_trace  | (VRT_Count:8 line:46 pos:13)
| VCL_trace  | (VRT_Count:9 line:49 pos:5)
| VCL_trace  | (VRT_Count:11 line:59 pos:5)
| VCL_trace  | (VRT_Count:13 line:63 pos:5)
| VCL_trace  | (VRT_Count:15 line:67 pos:5)
|
| return    | lookup
|
+-----+
|   hash    |
+-----+
|
| VCL_trace  | (VRT_Count:2 line:34 pos:1)
| Hash       | bar
| VCL_trace  | (VRT_Count:18 line:85 pos:5)
|
+-----+
```

vsitrans

```
96 12 RxHeader c Host: 192.168.1.199:6081
97 12 RxHeader c Connection: Keep-Alive
98 12 VCL_call  c recv 1 16.1
99 12 VCL_Log   c hogejojfdls
100 12 VCL_trace c 5 41.5
101 12 VCL_trace c 6 42.9
102 12 VCL_trace c 8 46.13
103 12 VCL_trace c 9 49.5
104 12 VCL_trace c 11 59.5
105 12 VCL_trace c 13 63.5
106 12 VCL_trace c 15 67.5
107 12 VCL_return c lookup
108 12 VCL_call  c hash 2 34.1
109 12 Hash      c bar
110 12 VCL_trace  c 18 85.5
111 12 Hash      c /esi.html
112 12 VCL_trace  c 19 87.9
113 12 Hash      c 192.168.1.199:6081
114 12 VCL_return c hash
115 12 VCL_call  c miss 22 99.5 fetch
116 12 Backend   c 14 default default
```

varnishlog

Screenshot

Action

```
#####
Action information.
-----
+-----+
|  recv  |
+-----+

VCL_trace | (VRT_Count:1 line:16 pos:1)
VCL_Log    | nogehofdis
VCL_trace | (VRT_Count:5 line:41 pos:5)
VCL_trace | (VRT_Count:6 line:42 pos:9)
VCL_trace | (VRT_Count:8 line:46 pos:13)
VCL_trace | (VRT_Count:9 line:49 pos:5)
VCL_trace | (VRT_Count:11 line:59 pos:5)
VCL_trace | (VRT_Count:13 line:63 pos:5)
VCL_trace | (VRT_Count:15 line:67 pos:5)

return     | lookup

+-----+
|  hash    |
+-----+

VCL_trace | (VRT_Count:2 line:34 pos:1)
Hash      | bar
VCL_trace | (VRT_Count:18 line:85 pos:5)
```

vsitrans

```
96 12 RxHeader c Host: 192.168.1.199:6081
97 12 RxHeader c Connection: Keep-Alive
98 12 VCL_call  c recv 1 16.1
99 12 VCL_Log   c nogehofdis
100 12 VCL_trace c 5 41.5
101 12 VCL_trace c 6 42.9
102 12 VCL_trace c 8 46.13
103 12 VCL_trace c 9 49.5
104 12 VCL_trace c 11 59.5
105 12 VCL_trace c 13 63.5
106 12 VCL_trace c 15 67.5
107 12 VCL_return c lookup
108 12 VCL_call  c hash 2 34.1
109 12 Hash      c bar
110 12 VCL_trace c 18 85.5
111 12 Hash      c /esi.html
112 12 VCL_trace c 19 87.9
113 12 Hash      c 192.168.1.199:6081
114 12 VCL_return c hash
115 12 VCL_call  c miss 22 99.5 fetch
116 12 Backend   c 14 default default
```

varnishlog

Variable

```

=====
Variable information.
-----
beresp.url                | /b.php
beresp.http.User-Agent    | Wget/1.12 (linux-gnu)
beresp.http.Accept        | */*
beresp.http.Host          | 192.168.1.199
beresp.http.restart       | 0
beresp.http.X-Forwarded-For | 192.168.1.199
beresp.http.hello         | b23228308dd19c6ea35060253b30a2df5ec74bcfe275581d22a8831a95f5022a
beresp.http.X-Varnish      | 2088372858
beresp.http.Accept-Encoding | gzip
beresp.request            | GET
beresp.proto              | HTTP/1.1
-----
beresp.status             | 200
beresp.http.Date          | Sun, 05 May 2013 05
beresp.http.Server        | Apache/2.2.15 (Scientific Linux)
beresp.http.X-Powered-By  | PHP/5.3.2
beresp.http.Cache-Control | max-age=0, no-cache
beresp.http.X-Mod-Pagespeed | 1.2.24.1-2581
beresp.http.Vary          | User-Agent
beresp.http.Content-Encoding | gzip
beresp.http.Content-Length | 47
beresp.http.Connection    | close
beresp.http.Content-Type  | text/html; charset=UTF-8
beresp.response           | OK
beresp.proto              | HTTP/1.1
-----
obj.http.Date             | Sun, 05 May 2013 05
obj.http.Server           | Apache/2.2.15 (Scientific Linux)
obj.http.X-Powered-By     | PHP/5.3.2
obj.http.Cache-Control    | max-age=0, no-cache
obj.http.X-Mod-Pagespeed  | 1.2.24.1-2581
obj.http.Vary             | User-Agent
obj.http.Content-Encoding | gzip
obj.http.Content-Length   | 47
obj.http.Content-Type     | text/html; charset=UTF-8
obj.response              | OK
obj.proto                 | HTTP/1.1
=====

```

vsitrans

```

61 14 BackendOpen default 127.0.0.1 45644 127.0.0.1 88
62 14 TxRequest b GET
63 14 TxURL b /b.php
64 14 TxProtocol b HTTP/1.1
65 14 TxHeader b User-Agent: Wget/1.12 (linux-gnu)
66 14 TxHeader b Accept: */*
67 14 TxHeader b Host: 192.168.1.193:6081
68 14 TxHeader b restart: 0
69 14 TxHeader b X-Forwarded-For: 192.168.1.199
70 14 TxHeader b hello: b23228308dd19c6a5f060253b30a2df5c74bcfe275581d22a8831a95f5022a
71 14 TxHeader b X-Varnish: 2088372858
72 14 TxHeader b Accept-Encoding: gzip
73 14 RxProtocol b HTTP/1.1
74 14 RxStatus b 200
75 14 RxResponse b OK
76 14 RxHeader b Date: Sun, 05 May 2013 05:30:42 GMT
77 14 RxHeader b Server: Apache/2.2.15 (Scientific Linux)
78 14 RxHeader b X-Powered-By: PHP/5.3.2
79 14 RxHeader b Cache-Control: max-age=0, no-cache
80 14 RxHeader b X-Mod-Pagespeed: 1.2.24.1-2581
81 14 RxHeader b Vary: User-Agent
82 14 RxHeader b Content-Encoding: gzip
83 14 RxHeader b Content-Length: 47
84 14 RxHeader b Connection: close
85 14 RxHeader b Content-Type: text/html; charset=UTF-8

```

```

175 12 VCL_return c hit_for_pass
176 12 ObjProtocol c HTTP/1.1
177 12 ObjResponse c OK
178 12 ObjHeader c Date: Sun, 05 May 2013 05:30:42 GMT
179 12 ObjHeader c Server: Apache/2.2.15 (Scientific Linux)
180 12 ObjHeader c X-Powered-By: PHP/5.3.2
181 12 ObjHeader c Cache-Control: max-age=0, no-cache
182 12 ObjHeader c X-Mod-Pagespeed: 1.2.24.1-2581
183 12 ObjHeader c Vary: User-Agent
184 12 ObjHeader c Content-Encoding: gzip
185 12 ObjHeader c Content-Length: 47
186 12 ObjHeader c Content-Type: text/html; charset=UTF-8
187 12 Gzip c U F E 47 32 00 00 00 00

```

varnishlog

Variable

```

#####
Variable information.
#####
bereg.url                | /b.php
bereg.http.User-Agent    | Wget/1.12 (linux-gnu)
bereg.http.Accept        | */*
bereg.http.Host          | 192.168.1.199
bereg.http.restart       | 0
bereg.http.X-Forwarded-For | 192.168.1.199
bereg.http.hello         | b23228308dd19c6ea35060253b30a2df5ec74bcfe275581d22a8831a95f5022a
bereg.http.X-Varnish      | 2088372858
bereg.http.Accept-Encoding | gzip
bereg.request            | GET
bereg.proto              | HTTP/1.1
#####
beresp.status            | 200
beresp.http.Date         | Sun, 05 May 2013 05
beresp.http.Server       | Apache/2.2.15 (Scientific Linux)
beresp.http.X-Powered-By | PHP/5.3.2
beresp.http.Cache-Control | max-age=0, no-cache
beresp.http.X-Mod-Pagespeed | 1.2.24.1-2581
beresp.http.Vary         | User-Agent
beresp.http.Content-Encoding | gzip
beresp.http.Content-Length | 47
beresp.http.Connection    | close
beresp.http.Content-Type  | text/html; charset=UTF-8
beresp.response          | OK
beresp.proto             | HTTP/1.1
#####
obj.http.Date            | Sun, 05 May 2013 05
obj.http.Server          | Apache/2.2.15 (Scientific Linux)
obj.http.X-Powered-By    | PHP/5.3.2
obj.http.Cache-Control    | max-age=0, no-cache
obj.http.X-Mod-Pagespeed  | 1.2.24.1-2581
obj.http.Vary            | User-Agent
obj.http.Content-Encoding | gzip
obj.http.Content-Length   | 47
obj.http.Content-Type     | text/html; charset=UTF-8
obj.response             | OK
obj.proto                | HTTP/1.1
#####

```

vsitrans

```

61 14 BackendOpen b default 127.0.0.1 49544 127.0.0.1 80
62 14 TxRequest b GET
63 14 TxURL b /b.php
64 14 TxProtocol b HTTP/1.1
65 14 TxHeader b User-Agent: Wget/1.12 (linux-gnu)
66 14 TxHeader b Accept: */*
67 14 TxHeader b Host: 192.168.1.199:8081
68 14 TxHeader b restart: 0
69 14 TxHeader b X-Forwarded-For: 192.168.1.199
70 14 TxHeader b hello: b23228308dd19c8ea35a60253b30a2df5ec74bcfe275581d22a8831a95f5022a
71 14 TxHeader b X-Varnish: 2088372858
72 14 TxHeader b Accept-Encoding: gzip
73 14 RxProtocol b HTTP/1.1
74 14 RxStatus b 200
75 14 RxResponse b OK
76 14 RxHeader b Date: Sun, 05 May 2018 05:30:42 GMT
77 14 RxHeader b Server: Apache/2.2.15 (Scientific Linux)
78 14 RxHeader b X-Powered-By: PHP/5.3.2
79 14 RxHeader b Cache-Control: max-age=0, no-cache
80 14 RxHeader b X-Mod-Pagespeed: 1.2.24.1-2581
81 14 RxHeader b Vary: User-Agent
82 14 RxHeader b Content-Encoding: gzip
83 14 RxHeader b Content-Length: 47
84 14 RxHeader b Connection: close
85 14 RxHeader b Content-Type: text/html; charset=UTF-8

```

```

175 | 12 VCL_return      c hit_for_pass
176 |   12 ObjProtocol    c HTTP/1.1
177 |   12 ObjResponse     c OK
178 |   12 ObjHeader       c Date: Sun, 05 May 2013 05:30:42 GMT
179 |   12 ObjHeader       c Server: Apache/2.2.15 (Scientific Linux)
180 |   12 ObjHeader       c X-Powered-By: PHP/5.3.2
181 |   12 ObjHeader       c Cache-Control: max-age=0, no-cache
182 |   12 ObjHeader       c X-Mod-Pagespeed: 1.2.24.1-2581
183 |   12 ObjHeader       c Vary: User-Agent
184 |   12 ObjHeader       c Content-Encoding: gzip
185 |   12 ObjHeader       c Content-Length: 47
186 |   12 ObjHeader       c Content-Type: text/html; charset=UTF-8
187 | 12 Gzip             c U F E 47 32 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

```

varnishlog

More measurements

- By different host
 - Cache hit rate
 - Transfer size per sec
 - Request per sec
- By directory (specify depth)
 - Cache hit rate
 - Transfer size per sec
 - Request per sec
- And more...

Why do we need a detailed measurements?



Dynamic object
(High cost)



Static object
(Low cost)

- Hit rate is summarized by default
- Different costs for different objects
 - Dynamic object: high cost
 - Static object: low cost
- It's necessary to separate results by object cost
- Need to consider system cost instead of just Varnish hit rate
- However you cannot do this with just the default commands

That's where libvarnishapi comes in

libvarnishapi.so

- VSL access is easy with libvarnishapi
 - uses varnishlog, varnishncsa
- Used Python ctypes and it proved to be very simple to use
- Sample code

<https://github.com/xcir/python-varnishapi>

python-varnishapi sample

```
12 Client -> Varnish RxRequest req.request GET
12 Client -> Varnish RxURL req.url /esi.html
12 Client -> Varnish RxProtocol req.proto HTTP/1.0
12 Client -> Varnish RxHeader req.http User-Agent: Wget/1.12 (linux-gnu)
12 Client -> Varnish RxHeader req.http Accept: */*
12 Client -> Varnish RxHeader req.http Host: 192.168.1.199:6081
12 Client -> Varnish RxHeader req.http Connection: Keep-Alive
12 Client VCL_call recv
12 Client VCL_trace 1 16.1
12 Client VCL_Log hogehojfdls
12 Client VCL_trace 5 41.5
12 Client VCL_trace 6 42.9
12 Client VCL_trace 8 46.13
12 Client VCL_trace 9 49.5
12 Client VCL_trace 11 59.5
```

- VSL data output sample
- Made it slightly more readable ;)

python-varnishapi sample

```
1 # coding: utf-8
2
3 import varnishapi,time
4
5 def main():
6     smp = SampleVarnishLog()
7     smp.execute()
8
9 class SampleVarnishLog:
10     def __init__(self):
11         #connect varnishapi
12         self.vap = varnishapi.VarnishAPI()
13         #utils
14         self.vslutil = varnishapi.VSLUtil()
15
16     def execute(self):
17         while 1:
18             #dispatch
19             self.vap.VSL_NonBlockingDispatch(self.vapCallback)
20             time.sleep(0.1)
```

python-varnishapi sample

```
22 ^ def vapCallback(self, priv, tag, fd, length, spec, ptr, bm):  
23 ^     if spec == 0:  
24 ^         return  
25 ^  
26 ^     nml = self.vap.normalizeDic(priv, tag, fd, length, spec, ptr, bm)  
27 ^  
28 ^     [rawdata]  
29 ^     12 ObjHeader    c Cache-Control: max-age=0, no-cache  
30 ^  
31 ^     [dict]  
32 ^     'fd'           : 12,  
33 ^     'type'         : 1,  
34 ^     'typeName'     : 'c',  
35 ^     'tag'          : 'ObjHeader',  
36 ^     'msg'          : 'Cache-Control: max-age=0, no-cache',  
37 ^  
38 ^     if spec == 1:  
39 ^         if nml['tag'][0:2] == "Rx":  
40 ^             nml['rxtx'] = 'Client -> Varnish'  
41 ^         elif nml['tag'][0:2] == "Tx":  
42 ^             nml['rxtx'] = 'Client <- Varnish'  
43 ^         else:  
44 ^             nml['rxtx'] = "Client"  
45 ^     elif spec == 2:  
46 ^         if nml['tag'][0:2] == "Rx":  
47 ^             nml['rxtx'] = 'Varnish <- Backend'  
48 ^         elif nml['tag'][0:2] == "Tx":  
49 ^             nml['rxtx'] = 'Varnish -> Backend'  
50 ^         else:  
51 ^             nml['rxtx'] = "Backend"  
52 ^  
53 ^     nml['var'] = self.vslutil.tags[spec][nml['tag']]  
54 ^     print "%5d %-20s %-12s %-16s %s" % (nml['fd'], nml['rxtx'], nml['tag'], nml['var'], nml['msg'])  
55 ^  
56 ^ main()
```

libvarnishapi: very easy to use

Hack on with libvarnishapi and Varnish!

Better than making a measuring tool
from scratch

Thank you for your attention!

Any Questions?

@xcir

<http://blog.xcir.net/>

<https://github.com/xcir/vtctrans>

<https://github.com/xcir/vsltrans>

<https://github.com/xcir/python-varnishapi>