

# HTTP基础

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# 大纲

- 网页/CGI及背后的HTTP
- HTTP 简介和Web Server
- HTTP内容
  - URI
  - Request – Response
  - Methods
  - Status code
  - Headers
- HTTP传输
  - TCP层面看HTTP协议
  - 代理(Proxy)，反向代理
  - CDN
  - HTTP压缩
  - 浏览器端缓存
- HTTP相关测试推荐工具
- 参考资料

# Web page

易迅网-专业的电脑、数码 x

www.51buy.com

手机易迅 易迅 QQ网购 拍拍 易迅

登录 QQ登录 注册 我的订单 我的易迅 服务中心 企业

易迅网6月5日—6月7日整点抢红包(支付宝)中奖名单公布

易迅 4周年 6.17 高潮将至 亿元红包免费送 海量品牌 强力满减

iPhone 5 免费送 100 优惠券 全民逗狗 抢红包 50 优惠券

易迅网 www.51buy.com 送至 上海 晚上买明早到

尖刀行动 搜索

正品低价 七日退

三星 Mega6.3 电风扇 端午1元抢 父亲节秒杀 热水器

全部分类 首页 家电城 天黑黑 团购 发现 最惠购 企业特惠 周末清仓 购物车 (0) 件

jiadian.51buy.com

Elements Resources Network Sources Timeline Profiles Audits Console PageSpeed

Name Path

www.51buy.com

gb.css?t=20130607152826 static.gtimg.com/icson/css/common/v0

index.css?t=20130605152215 static.gtimg.com/icson/css/index/v0

23-819-024.jpg img2.icson.com/product/pic160/23/819

21-073-10044.jpg img2.icson.com/product/pic160/21/073

01-144-268.jpg img2.icson.com/product/pic160/01/144

1\_big20130207092008428454.jpg img2.icson.com/ICSONAD/201302

01-266-022.jpg img2.icson.com/product/pic160/01/266

Headers Preview Response Cookies Timing

Request URL: http://www.51buy.com/  
Request Method: GET  
Status Code: 200 OK

Request Headers view source

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,\*/\*;q=0.8  
Accept-Encoding: gzip,deflate,sdch  
Accept-Language: en-US,en;q=0.8  
Connection: keep-alive  
Cookie: y\_guid=12F6632F6BD04900; flv=11.7 r700; r\_cookie=135105637016; pvid=482927982; o\_cookie=3007349; visitkey=63756780830814063; i; prid=2626\_2621; wsid=1; eggun=tencent\_cgil; fresherTipFlag=1; pt2gguin=o0003007349; uin=o0003007349; ptisp=ctc; yx\_uid=12440523; y; tskey=@YjKABCSvh; qq\_nick=12440523%7Crickyqiu; elt=0; backurl=http%3A/www.51buy.com/; ts\_refer=buy.51buy.com/order.html; vinfo=1371:184387960; areasInfo=S0001\_1; pgv\_info=ssid=s6969934256; pgv\_pvid=482927982; visited\_pids=412804%2C564600%2C444800%2C136740%2C580257; ck=0-100030014-0-21012060.3; y\_rfid=210%7C4128041; buy\_uin=3007349  
Host: www.51buy.com  
User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/28.0.1500.3 Safari/537.36

Response Headers view source

Cache-Control: max-age=0  
Connection: keep-alive  
Content-Encoding: gzip

# HTTP interface

http://app.51buy.com/json.php?mod=aitem&act=getdetail&pid=412804&provinceid=31&appSource=android&appVersion=14

app.51buy.com/json.php x

app.51buy.com/json.php?mod=aitem&act=getdetail&pid=412804&provinceid=31&appSource=android&appVersion=14

```
{
  "errno": 0,
  "data": {
    "t_color_block": [
      {
        "selected": "1",
        "product_id": "412804",
        "color": "白色",
        "product_char_id": "21-136-11000"
      }
    ],
    "t_size_block": [
      {
        "selected": "1",
        "product_id": "412804",
        "size": "16G"
      }
    ],
    "product_id": "412804",
    "promotion_word": "",
    "product_char_id": "21-136-11000",
    "name": "全网底价 Apple 苹果 iPhone 5 (16G) 3G (GSM/WCDMA) MD298CH/A",
    "canUseCoupon": false,
    "canVAT": false,
    "isGJP": true,
    "isJGBH": true,
    "pic_num": 6,
    "status": 1,
    "sale_type": 1,
    "stock": "有货, 可当日出库",
    "restricted_trans_type": "",
    "num_limit": 5,
    "lowest_num": 1,
    "price": 474700,
    "state": 0,
    "vip_price": 0,
    "vip_type": 0,
    "promote_price": {
      "end_time": "",
      "name": "",
      "notice_time": "",
      "price": 0,
      "price_type": 0,
      "start_time": "",
      "state": 2
    },
    "browser_path": {
      "c3_id": 3,
      "c2_id": 801,
      "c2_name": "手机通讯",
      "c1_id": 1007,
      "c1_name": "手机、摄影、数码"
    },
    "tuanning": 0,
    "review": {
      "satisfied_num": 2601,
      "general_num": 95,
      "unsatisfied_num": 42
    },
    "isCustomPhone": false,
    "browse_products": [
      {
        "product_id": 445118,
        "product_char_id": "21-136-11059",
        "name": "全网底价 Apple 苹果 iPhone 5 (32G) 3G (GSM/WCDMA) 手机 白色 MD300CH/A",
        "show_price": 564900,
        "market_price": 608800
      },
      {
        "product_id": 412826,
        "product_char_id": "21-136-11001",
        "name": "全网底价 Apple 苹果 iPhone 5 (16G) 3G (GSM/WCDMA) 手机 黑色 MD297CH/A",
        "show_price": 476600,
        "market_price": 528800
      },
      {
        "product_id": 445122,
        "product_char_id": "21-136-11061",
        "name": "全网底价 Apple 苹果 iPhone 5 (32G) 3G (GSM/WCDMA) 手机 黑色 MD299CH/A",
        "show_price": 559900,
        "market_price": 608800
      },
      {
        "product_id": 447554,
        "product_char_id": "21-136-11065",
        "name": "全网底价 Apple 苹果 iPhone 5 (16G) 3G (CDMA/CDMA2000) 手机 版本",
        "show_price": 489900,
        "market_price": 528800
      },
      {
        "product_id": 445121,
        "product_char_id": "21-136-11060",
        "name": "全网底价 Apple 苹果 iPhone 5 (64G) 3G (GSM/WCDMA) 手机 白色 MD663CH/A",
        "show_price": 619900,
        "market_price": 688800
      }
    ],
    "gifts": [
      {
        "product_id": 593408,
        "name": "雷尊 iPhone5 高清高透保护膜(前膜)",
        "product_char_id": "21-018-10081",
        "pic_num": 3,
        "price": 6900,
        "show_order": 110,
        "type": 0,
        "num": 1
      },
      {
        "product_id": 573970,
        "name": "雷尊 苹果专用三件套(触控笔、防尘塞、绕线器)",
        "product_char_id": "21-018-10053",
        "pic_num": 5,
        "price": 2900,
        "show_order": 10,
        "type": 0,
        "num": 1
      }
    ]
  }
}
```

Elements Resources Network Sources Timeline Profiles Audits Console PageSpeed

Name Path

json.php?mod=aitem&act=getdetail&pid=412804&...

style.css  
cpngackimfobokmjmljamhdncknpgm

page\_context.js  
cpngackimfobokmjmljamhdncknpgm

injections.js?\_id=1371370793709  
eacnkicdkfoenemaompckapllanbbog/assets/js

Headers Preview Response Cookies Timing

Request URL: <http://app.51buy.com/json.php?mod=aitem&act=getdetail&pid=412804&provinceid=31&appSource=android&appVersion=14>

Request Method: GET

Status Code: 200 OK

Request Headers view parsed

GET /json.php?mod=aitem&act=getdetail&pid=412804&provinceid=31&appSource=android&appVersion=14 HTTP/1.1

Host: app.51buy.com

Connection: keep-alive

Cache-Control: max-age=0

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,\*/\*;q=0.8

User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/28.0.1500.3 Safari/537.36

Accept-Encoding: gzip, deflate, sdch

Accept-Language: en-US,en;q=0.8

Cookie: y\_guid=12F6632E68D04900; flv=11.7 r700; r\_cookie=135105637016; pvid=482927982; o\_cookie=3007349; visitkey=637567808308141; prid=2626\_2621; wsid=1; eggun=tencent\_cgill; fresherTipFlag=1; pt2gguin=o0003007349; uin=o0003007349; ptisp=ctc; yx\_uid=124405ptskey=@VjKABCsVh; qq\_nick=12440523%7Crickyqiu; elt=0; backurl=http%3A/www.51buy.com/; vinfo=1371367007; areasInfo=S0001\_1; pgv56; pgv\_pvid=482927982; visited\_pids=412804%2C564600%2C444800%2C136740%2C580257%2C630988; y\_track=0-100030014-0-21012060.3; y\_r\_f\_y\_uin=3007349

Query String Parameters view parsed

mod=aitem&act=getdetail&pid=412804&provinceid=31&appSource=android&appVersion=14

Response Headers view parsed

HTTP/1.1 200 OK

Server: icson

Date: Sun, 16 Jun 2013 08:19:53 GMT

# HTTP协议简介

超文本传输协议（Hypertext Transfer Protocol，简称HTTP）是应用层协议，自 1990 年起，HTTP 就已经被应用于 WWW 全球信息服务系统。

HTTP 是一种请求/响应式的协议。一个客户机与服务器建立连接后，发送一个请求给服务器；服务器接到请求后，给予相应的响应信息。

HTTP 的第一版本 HTTP/0.9是一种简单的用于网络间原始数据传输的协议；

HTTP/1.0由 RFC 1945 定义，在原 HTTP/0.9 的基础上，有了进一步的改进，允许消息以类 MIME 信息格式存在，包括请求/响应范式中的已传输数据和修饰符等方面的信息；

HTTP/1.1(RFC2616) 的要求更加严格以确保服务的可靠性，增强了在HTTP/1.0 没有充分考虑到分层代理服务器、高速缓冲存储器、持久连接需求或虚拟主机等方面的效能；

安全增强版的 HTTP（即S-HTTP或HTTPS），则是HTTP协议与安全套接口层(SSL)的结合，使HTTP的协议数据在传输过程中更加安全。

# 一个极简的Web Server

```
require 'socket'
require 'cgi'

server = TCPServer.new('127.0.0.1', 8081)
puts 'Listening on 127.0.0.1:8081'

loop {
  client = server.accept
  first_request_header = client.gets
  client.puts "HTTP/1.1 200 OK\nContent-Type: text/html\r\n\r\n<h1>Hello from ruby web server!</h1>"
  client.close
}
```



**Hello from ruby web server!**

# HTTP常见内容

# HTTP 内容 - URI

HTTP URL (URL是一种特殊类型的URI-Uniform Resource Identifier, 包含了用于查找某个资源的足够的信息)的格式如下:

`http://host[":"port][abs_path]`

eg: <http://item.51buy.com/item-564600.html>

<http://10.1.68.5:8080>

- http表示要通过HTTP协议来定位网络资源;
- host表示合法的Internet主机域名或者IP地址;
- port指定一个端口号, 为空则使用缺省端口80;
- abs\_path指定请求资源的URI; 如果URL中没有给出abs\_path, 那么当它作为请求URI时, 必须以“/”的形式给出, 通常这个工作浏览器自动帮我们完成。

eg: 输入: [www.51buy.com](http://www.51buy.com), 浏览器自动转换成: <http://www.51buy.com/>



## HTTP 内容 - Request – Response

## HTTP是一个基于请求与响应模式的、无状态的、应用层的协议

Frame Number	Time Delta	Process Name	Source	Destination	Http Summary	Http Status Reason	HTTP Summary Type
7543	0.0000000	IEXPLORE.EXE	10.73.11.34	www.51buy.com			
7544	0.0004606	IEXPLORE.EXE	10.73.11.34	www.51buy.com			
7545	0.0017633	IEXPLORE.EXE	www.51buy.com	10.73.11.34			
7546	0.0001973	IEXPLORE.EXE	10.73.11.34	www.51buy.com			
7547	0.0007540	IEXPLORE.EXE	10.73.11.34	www.51buy.com	Request, GET /		
7548	0.0012147	IEXPLORE.EXE	www.51buy.com	10.73.11.34			
7549	0.0000678	IEXPLORE.EXE	10.73.11.34	www.51buy.com			
7550	0.0049319	IEXPLORE.EXE	www.51buy.com	10.73.11.34			
7551	0.0089684	IEXPLORE.EXE	www.51buy.com	10.73.11.34	Response, HTTP/1.1, Status: Ok, URL: /	OK	
7552	0.0086660	IEXPLORE.EXE	www.51buy.com	10.73.11.34			
7553	0.0000000	IEXPLORE.EXE	www.51buy.com	10.73.11.34			

```

Frame Details
-----
Frame: Number = 7551, Captured Frame Length = 1544, MediaType = WiFi
+ WiFi: [Unencrypted Data] F.....P, (I) RSSI = -47 dBm, Rate = 67.5 Mbps
+ LLC: Unnumbered(U) Frame, Command Frame, SSAP = SNAP(Sub-Network Access Protocol), DSAP = SNAP(Sub-Network Access Protocol)
+ Snap: EtherType = Internet IP (IPv4), OrgCode = XEROX CORPORATION
+ Ipv4: Src = 101.226.49.43, Dest = 10.73.11.34, Next Protocol = TCP, Packet ID = 12008, Total IP Length = 1480
+ Tcp: Flags=...A...., SrcPort=HTTP(80), DstPort=25158, PayloadLen=1440, Seq=4262736291 - 4262737731, Ack=1273349268, Win=15 (scale factor)
+ Http: Response, HTTP/1.1, Status: Ok, URL: /
    ... ProtocolVersion: HTTP/1.1
    ... StatusCode: 200, Ok
    ... Reason: OK
    ... Server: icson
    ... Date: Sun, 16 Jun 2013 06:40:34 GMT
    + Content-Type: text/html
    ... TransferEncoding: chunked
    ... Connection: keep-alive
    ... Vary: Accept-Encoding
    ... Expires: Sun, 16 Jun 2013 06:40:34 GMT
    ... Cache-Control: max-age=0
    ... X-Cache: HIT-LT

```

# HTTP内容 – 请求

HTTP请求由三部分组成，分别是：请求行、消息报头、请求正文

请求行以一个方法符号开头，以空格分开，后面跟着请求的URI和协议的版本，格式如下：

Method Request-URI HTTP-Version CRLF

其中 Method表示请求方法； Request-URI是一个统一资源标识符； HTTP-Version表示请求的HTTP协议版本； CRLF表示回车和换行（除了作为结尾的CRLF外，不允许出现单独的CR或LF字符）。

```
GET http://www.51buy.com/ HTTP/1.1
Host: www.51buy.com
Connection: keep-alive
Cache-Control: no-cache
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Pragma: no-cache
User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/28.0.1500.3 Safari/537.
Accept-Encoding: gzip,deflate,sdch
Accept-Language: en-US,en;q=0.8
Cookie: y_guid=12F6632E6BD04900; flv=11.7 r700; r_cookie=135105637016; pvid=482927982; o_cookie=3007349; visitkey=637
```

```
POST http://buy.51buy.com/json.php?mod=orderprocess&act=getpaytypeofshipping&uid=12440523 HTTP/1.1
Host: buy.51buy.com
Connection: keep-alive
Content-Length: 49
Accept: application/json, text/javascript, */*; q=0.01
Origin: http://buy.51buy.com
X-Requested-With: XMLHttpRequest
User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/28.0.1500.3 Safari/537.36
Content-Type: application/x-www-form-urlencoded
Referer: http://buy.51buy.com/order.html
Accept-Encoding: gzip,deflate,sdch
Accept-Language: en-US,en;q=0.8
Cookie: y_guid=12F6632E6BD04900; flv=11.7 r700; r_cookie=135105637016; pvid=482927982; o_cookie=3007349; visitkey=6375678083081

shippingtype=1&carttype=0&products=17245%2C500759
```

# HTTP内容 – 请求method类型

请求方法（所有方法全为大写）有多种，各个方法的解释如下：

**GET** 请求获取Request-URI所标识的资源

**POST** 在Request-URI所标识的资源后附加新的数据

**HEAD** 请求获取由Request-URI所标识的资源的响应消息报头

**PUT** 请求服务器存储一个资源，并用Request-URI作为其标识

**DELETE** 请求服务器删除Request-URI所标识的资源

**TRACE** 请求服务器回送收到的请求信息，主要用于测试或诊断

**CONNECT** 保留将来使用

**OPTIONS** 请求查询服务器的性能，或者查询与资源相关的选项和需求

# HTTP内容-响应

**HTTP响应也是由三个部分组成，分别是：状态行、消息报头、响应正文。**

```
HTTP/1.1 302 Moved Temporarily
Location: http://www.google.com.hk/url?sa=p&hl=zh-CN&pref=hkredirect&pval=yes&q=http://www.google.com.hk/&ust
Cache-Control: private
Content-Type: text/html; charset=UTF-8
Date: Sun, 16 Jun 2013 07:02:30 GMT
Server: gws
Content-Length: 376
X-XSS-Protection: 1; mode=block
X-Frame-Options: SAMEORIGIN
X-Cache-Lookup: MISS from proxy:8080
X-Cache-Lookup: MISS from proxy:8080

<HTML><HEAD><meta http-equiv="content-type" content="text/html; charset=utf-8">
<TITLE>302 Moved</TITLE></HEAD><BODY>
<H1>302 Moved</H1>
The document has moved
<A HREF="http://www.google.com.hk/url?sa=p&hl=zh-CN&pref=hkredirect&pval=yes&q=http://www.google.com.hk/">
</BODY></HTML>
```

```
GET http://img2.icson.com/product/pic160/39/106/39-106-966.jpg HTTP/1.1
Accept: image/png, image/svg+xml, image/*;q=0.8, */*;q=0.5
Referer: http://www.51buy.com/
Accept-Language: zh-CN
User-Agent: Mozilla/5.0 (compatible; MSIE 10.0; Windows NT 6.1; WOW64; Trident/6.0)
Accept-Encoding: gzip, deflate
Connection: Keep-Alive
DNT: 1
Host: img2.icson.com
```

Find... (press Ctrl+Enter to highlight all)

View in Notepad

Get SyntaxView	Transformer	Headers	TextView	ImageView	HexView	WebView	Auth	Caching	Cookies	Raw	JSON	XML
----------------	-------------	---------	----------	-----------	---------	---------	------	---------	---------	-----	------	-----

```
HTTP/1.1 200 OK
Server: NWS_icson_HY
Connection: keep-alive
Cache-Control: max-age=2592000
Last-Modified: Fri, 31 Aug 2012 02:35:10 GMT
Content-Type: image/jpeg
Content-Length: 4997
```

```
00000000JIF00000000000000JExif00II*00000000i0000000000000000000000,0000000000000000tencent-youtu0000C00000000000000000
00000000
```

```
0  
000000000000000000000000000000 "C0000000
```

[illegible]

# HTTP内容－响应－状态码

状态行格式如下：

HTTP-Version Status-Code Reason-Phrase CRLF

其中，HTTP-Version表示服务器HTTP协议的版本；Status-Code表示服务器发回的响应状态代码；Reason-Phrase表示状态代码的文本描述。

状态代码有三位数字组成，第一个数字定义了响应的类别，且有五种可能取值：

1xx： 指示信息--表示请求已接收，继续处理

2xx： 成功--表示请求已被成功接收、理解、接受

3xx： 重定向--要完成请求必须进行更进一步的操作

4xx： 客户端错误--请求有语法错误或请求无法实现

5xx： 服务器端错误--服务器未能实现合法的请求

常见状态代码、状态描述、说明：

200 OK //客户端请求成功

400 Bad Request //客户端请求有语法错误，不能被服务器所理解

401 Unauthorized //请求未经授权，这个状态代码必须和WWW-Authenticate报头域一起使用

403 Forbidden //服务器收到请求，但是拒绝提供服务

404 Not Found //请求资源不存在，eg：输入了错误的URL

500 Internal Server Error //服务器发生不可预期的错误

503 Server Unavailable //服务器当前不能处理客户端的请求，一段时间后可能恢复正常

eg： HTTP/1.1 200 OK （CRLF）

# HTTP内容 - 消息头 - 请求

```
x Headers Preview Response Cookies Timing
Request URL: http://www.51buy.com/
Request Method: GET
Status Code: 200 OK
▼ Request Headers view source
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Encoding: gzip,deflate,sdch
Accept-Language: en-US,en;q=0.8
Cache-Control: no-cache
Cookie: y_guid=12F6632E6BD04900; flv=11.7 r700; r_cookie=135105637016; pvid=482927982; o_cookie=3007349; visitkey=63756780830814063; indextopadv_sh=1; p
rid=2626_2621; wsid=1; eggun=tencent_cg11; fresherTipFlag=1; visited_pids=564600%2C444800%2C136740%2C580257%2C630988%2C412804; pt2gguin=o0003007349; ui
n=o0003007349; ptisp=ctc; yx_uid=12440523; yx_uin=3007349; uid=12440523; wg_skey=@YjKABCsvh; skey=@YjKABCsvh; ptskey=@YjKABCsvh; qq_nick=12440523%7Cric
kyqiu; elt=0; backurl=http%3A//www.51buy.com/; y_track=0-100030014-0-0.1; y_rfid=250%7C1000; ts_refer=buy.51buy.com/order.html; vinfo=1371366342; areas
Info=50001_1; pgv_info=ssid=s6969934256; ts_last=www.51buy.com/; pgv_pvid=482927982; ts_uid=3184387960; buy_uin=3007349
Host: www.51buy.com
Pragma: no-cache
Proxy-Connection: keep-alive
User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/28.0.1500.3 Safari/537.36
```

**Accept:** 请求报头域用于指定客户端接受哪些类型的信息。

**Accept-Charset:** 请求报头域用于指定客户端接受的字符集。

**Accept-Encoding:** 请求报头域类似于Accept，但是它是用于指定可接受的内容编码。

**Accept-Language:** 请求报头域类似于Accept，但是它是用于指定一种自然语言。

**Host:** 请求报头域主要用于指定被请求资源的Internet主机和端口号，它通常从HTTP URL中提取出来的

**User-Agent:** 请求报头域允许客户端将它的操作系统、浏览器和其它属性告诉服务器。

**Cookie:** 告诉服务器本地的cookie信息。通常用于身份的识别等个性化的信息

**Date:** 普通报头域表示消息产生的日期和时间

**Connection:** 普通报头域允许发送指定连接的选项。

# HTTP内容 – 消息头 – 请求 – User-Agent

试一下在手机上的  
浏览器里面  
输入

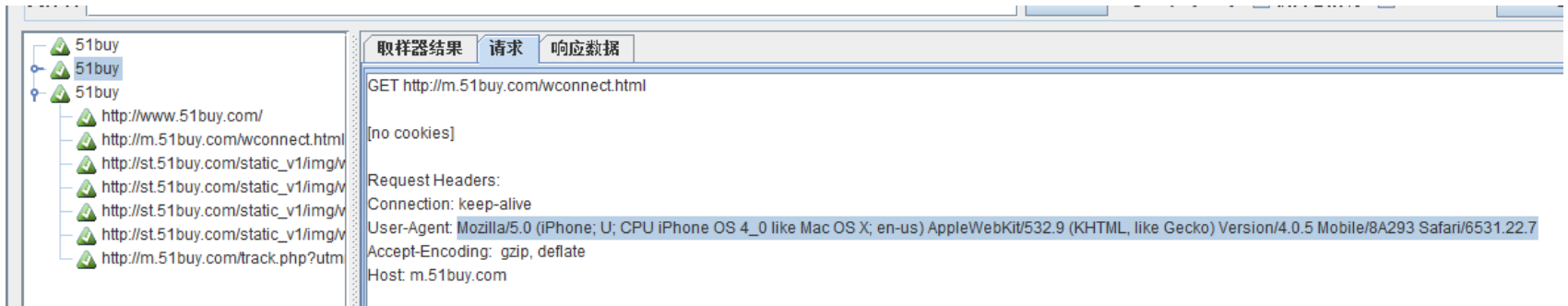
[www.51buy.com](http://www.51buy.com)

怎么做到的？



# HTTP内容 – 消息头 – 请求 – User-Agent

User-Agent: Mozilla/5.0 (iPhone; U; CPU iPhone OS 4\_0 like Mac OS X; en-us) AppleWebKit/532.9 (KHTML, like Gecko) Version/4.0.5 Mobile/8A293 Safari/6531.22.7





51buy

51buy

http://www.51buy.com/

http://m.51buy.com/wconnect.html

取样器结果

请求

响应数据

Thread Name:

Sample Start: 2013-06-16 15:49:10 CST

Load time: 9

Latency: 9

Size in bytes: 450

Headers size in bytes: 285

Body size in bytes: 165

Sample Count: 1

Error Count: 0

Response code: 302

Response message: Moved Temporarily

51buy

51buy

51buy

http://www.51buy.com/

http://m.51buy.com/wconnect.html

http://st.51buy.com/static\_v1/img/v

http://st.51buy.com/static\_v1/img/v

http://st.51buy.com/static\_v1/img/v

http://st.51buy.com/static\_v1/img/v

http://m.51buy.com/track.php?utm

取样器结果

请求

响应数据

返回首页

登录 | QQ登录


易迅有手机客户端啦，要不要试试？


下载易迅客户端获得更佳体验：

 立即下载

 立即下载

您还可以选择以下版本继续浏览：

 手机版

 电脑版

服务热线：400-828-1878

首页 | 我的易迅 | 购物车 | 浏览历史

购物指南 | 意见反馈 | 货到付款

# HTTP内容 – 消息头 – 实体报头

▼ Response Headers [view source](#)

```
Cache-Control: max-age=0
Connection: keep-alive
Content-Encoding: gzip
Content-Length: 32572
Content-Type: application/x-javascript
Last-Modified: Tue, 06 Sep 2011 05:57:13 GMT
Server: NWS_icson_HY
```

请求和响应消息都可以传送一个实体。一个实体由实体报头域和实体正文组成，实体报头定义了关于实体正文和请求所标识的资源的元信息。

常用的实体报头

**Content-Encoding:** 被用作媒体类型的修饰符，它的值指示了已经被应用到实体正文的附加内容的编码，因而要获得**Content-Type**报头域中所引用的媒体类型，必须采用相应的解码机制。**Content-Encoding**这样用于记录文档的压缩方法，eg: **Content-Encoding: gzip**

**Content-Language**实体报头域描述了资源所用的自然语言。没有设置该域则认为实体内容将提供给所有的语言阅读者 eg: **Content-Language: en-US**

**Content-Length:** 用于指明实体正文的长度，以字节方式存储的十进制数字来表示。

**Content-Type:** 指明发送给接收者的实体正文的媒体类型。

eg : **Content-Type: text/html; charset=GB2312**

**Last-Modified:** 实体报头域用于指示资源的最后修改日期和时间。

**Expires:** 给出响应过期的日期和时间。

# HTTP传输

# HTTP的基于TCP的网络请求

一次独立的HTTP请求和响应的过程:

No.	Time	Source	src port	Destination	dest port	Protocol	Length	Info
15	1.91833300	10.73.11.34	36906	101.226.49.43	80	TCP	66	36906 > http [SYN] Seq=0 win=8192 Len=0 MSS=1460 WS=256 SACK_PERM=1
16	1.92756400	101.226.49.43	80	10.73.11.34	36906	TCP	66	http > 36906 [SYN, ACK] Seq=0 Ack=1 win=5760 Len=0 MSS=1440 SACK_PERM=1 WS=512
17	1.92762800	10.73.11.34	36906	101.226.49.43	80	TCP	54	36906 > http [ACK] Seq=1 Ack=1 win=17152 Len=0
18	1.92852800	10.73.11.34	36906	101.226.49.43	80	HTTP	309	GET / HTTP/1.1
19	1.93173400	101.226.49.43	80	10.73.11.34	36906	TCP	60	http > 36906 [ACK] Seq=1 Ack=256 win=7168 Len=0
20	1.93333000	101.226.49.43	80	10.73.11.34	36906	HTTP	504	HTTP/1.1 302 Moved Temporarily (text/html)
21	1.93333100	101.226.49.43	80	10.73.11.34	36906	TCP	60	http > 36906 [FIN, ACK] Seq=451 Ack=256 win=7168 Len=0
22	1.93338000	10.73.11.34	36906	101.226.49.43	80	TCP	54	36906 > http [ACK] Seq=256 Ack=452 win=16640 Len=0
23	1.93537300	10.73.11.34	36906	101.226.49.43	80	TCP	54	36906 > http [FIN, ACK] Seq=256 Ack=452 win=16640 Len=0
25	1.94915200	101.226.49.43	80	10.73.11.34	36906	TCP	60	http > 36906 [ACK] Seq=452 Ack=257 win=7168 Len=0

Frame 18: 309 bytes on wire (2472 bits), 309 bytes captured (2472 bits) on interface 0

Ethernet II, Src: LiteonTe\_a2:4c:6a (68:a3:c4:a2:4c:6a), Dst: Cisco\_fb:ff:4c (00:19:aa:fb:ff:4c)

Internet Protocol Version 4, Src: 10.73.11.34 (10.73.11.34), Dst: 101.226.49.43 (101.226.49.43)

Transmission Control Protocol, Src Port: 36906 (36906), Dst Port: http (80), Seq: 1, Ack: 1, Len: 255

Hypertext Transfer Protocol

GET / HTTP/1.1\r\nconnection: keep-alive\r\nUser-Agent: Mozilla/5.0 (iPhone; U; CPU iPhone OS 4\_0 like Mac OS X; en-us) AppleWebKit/532.9 (KHTML, like Gecko) version/4.0.5 Mobile/8A293 safari/65Accept-Encoding: gzip, deflate\r\nHost: www.51buy.com\r\n\r\nFull request URI: http://www.51buy.com/

# 协议的层次

Filter: tcp.port == 36906 Expression... Clear Apply Save

Frame 18: 309 bytes on wire (2472 bits), 309 bytes captured (2472 bits) on interface 0

Ethernet II, Src: LiteonTe\_a2:4c:6a (68:a3:c4:a2:4c:6a), Dst: Cisco\_fb:ff:4c (00:19:aa:fb:ff:4c)

- Destination: Cisco\_fb:ff:4c (00:19:aa:fb:ff:4c)
- Source: LiteonTe\_a2:4c:6a (68:a3:c4:a2:4c:6a)
- Type: IP (0x0800)

Internet Protocol Version 4, Src: 10.73.11.34 (10.73.11.34), Dst: 101.226.49.43 (101.226.49.43)

- Version: 4
- Header length: 20 bytes
- Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00: Not-ECT (Not ECN-Capable Transport))
- Total Length: 295
- Identification: 0x1ec2 (7874)
- Flags: 0x02 (Don't Fragment)
- Fragment offset: 0
- Time to live: 64
- Protocol: TCP (6)
- Header checksum: 0x6e97 [correct]
- Source: 10.73.11.34 (10.73.11.34)
- Destination: 101.226.49.43 (101.226.49.43)
- [Source GeoIP: Unknown]
- [Destination GeoIP: Unknown]

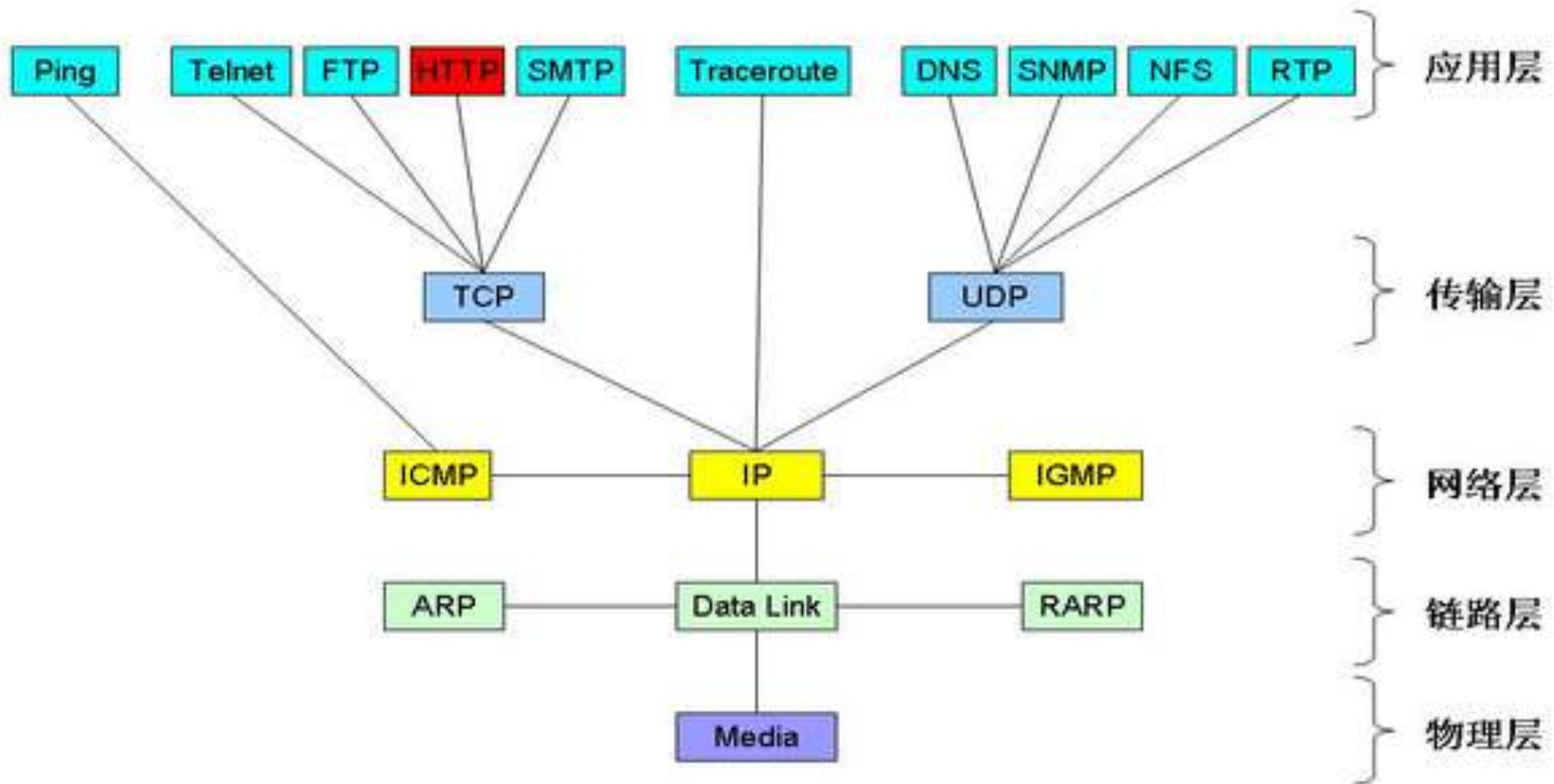
Transmission Control Protocol, Src Port: 36906 (36906), Dst Port: http (80), Seq: 1, Ack: 1, Len: 255

- Source port: 36906 (36906)
- Destination port: http (80)
- [Stream index: 2]
- Sequence number: 1 (relative sequence number)
- [Next sequence number: 256 (relative sequence number)]
- Acknowledgment number: 1 (relative ack number)
- Header length: 20 bytes
- Flags: 0x018 (PSH, ACK)
- window size value: 67
- [Calculated window size: 17152]
- [window size scaling factor: 256]
- Checksum: 0x1130 [validation disabled]
- [SEQ/ACK analysis]

Hypertext Transfer Protocol

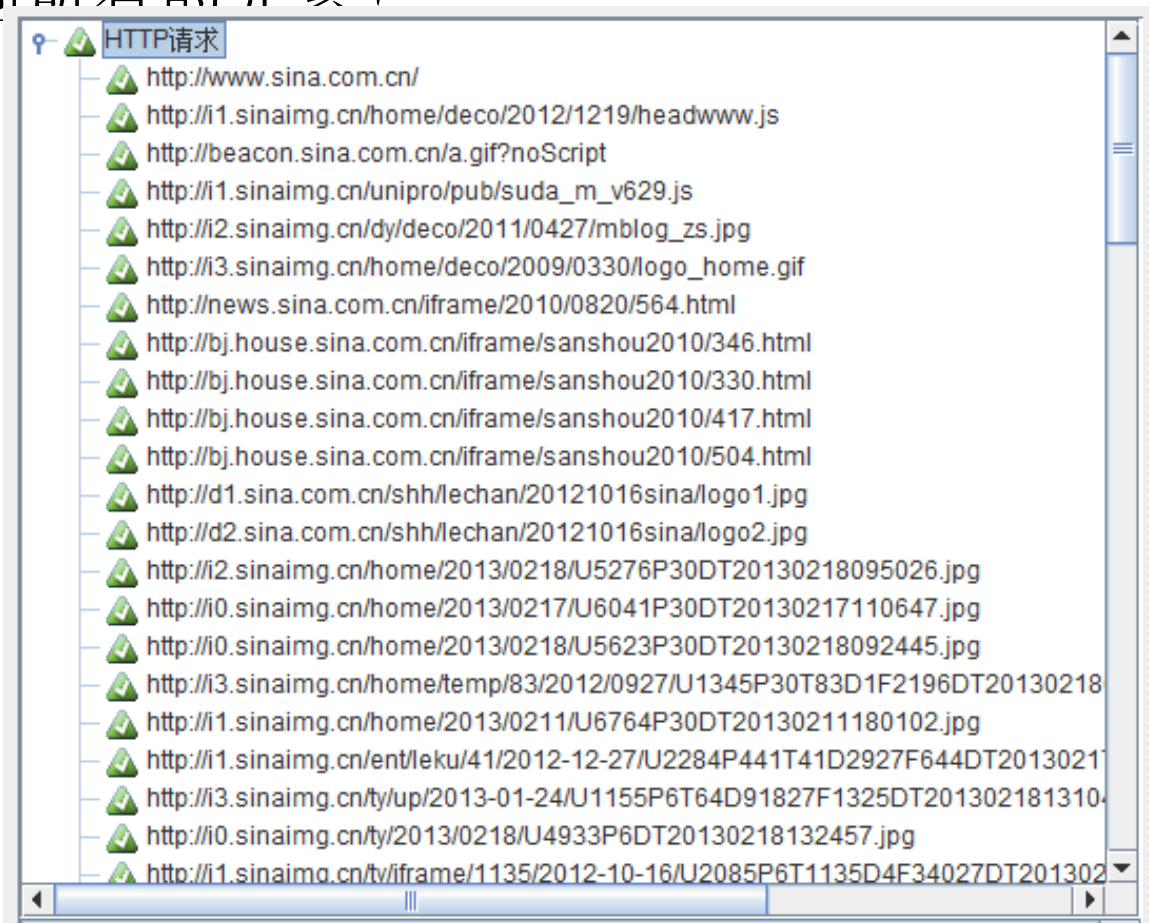
- GET / HTTP/1.1\r\n
- Connection: keep-alive\r\n
- User-Agent: Mozilla/5.0 (iPhone; U; CPU iPhone OS 4\_0 like Mac OS X; en-us) AppleWebKit/532.9 (KHTML, like Gecko) Version/4
- Accept-Encoding: gzip, deflate\r\n
- Host: www.51buy.com\r\n
- \r\n
- [Full request URI: <http://www.51buy.com/>]

# HTTP和TCP/IP协议的层次



# HTTP协议的TCP级别并行

某段时间，sina的首页有112个元素，从网络层如何取回所有的元素？



# 讨论

1. HTTP请求是基于TCP连接的，TCP连接有建立和断开的过程。
2. 每一个URL（一个HTTP元素）都需要发送一个HTTP请求，并接收响应。

所以你觉得浏览器是如何通过TCP连接取回这112个URL的？



## Possible ways:

1. (Open a connection → get one URL → Close the connection) loop
2. Open a connection → (get URL one by one) loop → Close the connection.
3. Open multiple thread { open a connection → get one URL → Close a connection }
4. Open multiple thread { open a connection → (get URL one by one) loop → Close a connection }

IE6.2.pcap - Wireshark

File Edit View Go Capture Analyze Statistics Help

Filter: Expression... Clear Apply

No.	Time	Source	src port	Destination	dest port	Protocol	Info
1	0.000000	10.64.44.116	3826	10.64.1.62	8080	HTTP	GET http://www.sina.com/ HTTP/1.0
2	0.114734	10.64.1.62	8080	10.64.44.116	3826	HTTP	HTTP/1.0 301 Moved Permanently (text/html)
3	0.184001	10.64.44.116	3827	10.64.1.62	8080	HTTP	GET http://www.sina.com.cn/ HTTP/1.0
4	3.356707	10.64.44.116	3828	10.64.1.62	8080	HTTP	GET http://13.sinaimg.cn/home/sinaflash.js HTTP/1.0
5	3.382274	10.64.1.62	8080	10.64.44.116	3827	HTTP	Continuation or non-HTTP traffic
6	3.543890	10.64.1.62	8080	10.64.44.116	3828	HTTP	Continuation or non-HTTP traffic
7	3.555925	10.64.44.116	3828	10.64.1.62	8080	HTTP	GET http://dl.sina.com.cn/dlimages/button/rotator.js HTTP/1.0
8	3.741628	10.64.1.62	8080	10.64.44.116	3828	HTTP	[TCP Previous segment lost] Continuation or non-HTTP traffic
9	3.829535	10.64.44.116	3828	10.64.1.62	8080	HTTP	GET http://12.sinaimg.cn/unipro/pub/suda_m_v619.js HTTP/1.0
10	4.115902	10.64.1.62	8080	10.64.44.116	3828	HTTP	[TCP Previous segment lost] Continuation or non-HTTP traffic
11	4.128029	10.64.44.116	3828	10.64.1.62	8080	HTTP	GET http://dl.sina.com.cn/shhy/2008Topbar/2008Topbar.js HTTP/1.0
12	4.251684	10.64.1.62	8080	10.64.44.116	3828	HTTP	HTTP/1.0 200 OK (application/javascript)
13	4.274647	10.64.44.116	3828	10.64.1.62	8080	HTTP	GET http://11.sinaimg.cn/home/deco/2008/0329/sinahome_0803_ws_001
14	4.280617	10.64.44.116	3829	10.64.1.62	8080	HTTP	GET http://10.sinaimg.cn/dy/deco/2008/0416/sinahome_0803_ws_002.n
15	4.292364	10.64.44.116	3830	10.64.1.62	8080	HTTP	GET http://news.sina.com.cn/iframe/20080331/8.js HTTP/1.0
16	4.388077	10.64.1.62	8080	10.64.44.116	3828	HTTP	[TCP Previous segment lost] Continuation or non-HTTP traffic
17	4.388859	10.64.44.116	3831	10.64.1.62	8080	HTTP	GET http://beacon.sina.com.cn/d.gif?guid1227174117049 HTTP/1.0
18	4.549491	10.64.1.62	8080	10.64.44.116	3831	HTTP	HTTP/1.1 200 OK (GIF89a)
19	4.578753	10.64.1.62	8080	10.64.44.116	3830	HTTP	Continuation or non-HTTP traffic
20	4.603493	10.64.44.116	3828	10.64.1.62	8080	HTTP	GET http://13.sinaimg.cn/home/deco/2008/0325/sinahome_Logo.gif HT
21	4.604853	10.64.44.116	3832	10.64.1.62	8080	HTTP	GET http://11.sinaimg.cn/home/deco/2008/0329/sinahome_ws_037.gif
22	4.607027	10.64.44.116	3833	10.64.1.62	8080	HTTP	GET http://news.sina.com.cn/iframe/2008/weather/jump_new.html HTT
23	4.611688	10.64.1.62	8080	10.64.44.116	3829	HTTP	Continuation or non-HTTP traffic
24	4.622736	10.64.44.116	3829	10.64.1.62	8080	HTTP	GET http://data.house.sina.com.cn/ip/sina_js.php HTTP/1.0
25	4.715549	10.64.1.62	8080	10.64.44.116	3832	HTTP	HTTP/1.0 200 OK (GIF89a)
26	4.715696	10.64.44.116	3832	10.64.1.62	8080	HTTP	GET http://dl.sina.com.cn/200811/19/158936_640901angshou_tunbob_1
27	4.734849	10.64.1.62	8080	10.64.44.116	3829	TCP	[TCP Previous segment lost] 8080 > 3829 [FIN, ACK] Seq=14117 Ack=
28	4.738067	10.64.44.116	3834	10.64.1.62	8080	HTTP	GET http://630.adsina.allyes.com/main/adFshow?user=AFP6_for_SINA
29	4.742434	10.64.1.62	8080	10.64.44.116	3834	TCP	8080 > 3834 [FIN, ACK] Seq=811 Ack=581 Win=64954 Len=0
30	4.743226	10.64.44.116	3835	10.64.1.62	8080	HTTP	GET http://630.adsina.allyes.com/main/adFshow?user=AFP6_for_SINA
31	4.745082	10.64.1.62	8080	10.64.44.116	3835	TCP	8080 > 3835 [FIN, ACK] Seq=808 Ack=417 Win=65118 Len=0
32	4.745845	10.64.44.116	3836	10.64.1.62	8080	HTTP	GET http://ofo.sina.com.cn/ofonew/info/res/1034.js HTTP/1.0

Frame 1 (525 bytes on wire, 525 bytes captured)

Ethernet II, Src: 00:21:9b:6a:94:cd (00:21:9b:6a:94:cd), Dst: 00:1f:9d:c0:3a:67 (00:1f:9d:c0:3a:67)

Internet Protocol, Src: 10.64.44.116 (10.64.44.116), Dst: 10.64.1.62 (10.64.1.62)

Transmission Control Protocol, Src Port: 3826 (3826), Dst Port: 8080 (8080), Seq: 0, Ack: 0, Len: 471

Hypertext Transfer Protocol

GET http://www.sina.com/ HTTP/1.0\r\n

Request Method: GET

Request URI: http://www.sina.com/

Request Version: HTTP/1.0

Accept: image/gif, image/x-bitmap, image/jpeg, image/pjpeg, application/x-shockwave-flash, application/vnd.ms-excel, application/vnd.ms-powerpoint, applic

Accept-Language: en-us\r\n

Cookie: sinaRotator/=72; SSCSum=3; rpb\_1\_1=1227172348606; s\_d1=1\r\n

User-Agent: Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1; SV1; InfoPath.1; .NET CLR 1.1.4322; .NET CLR 2.0.50727)\r\n

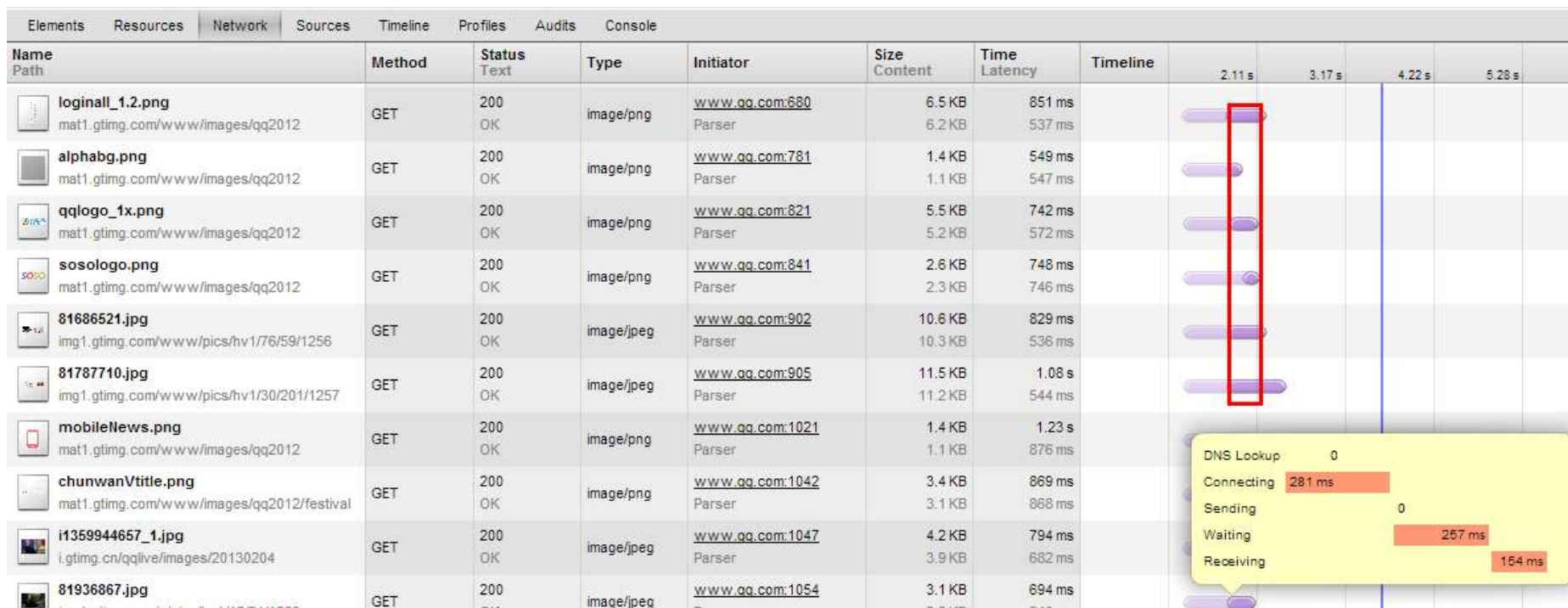
Host: www.sina.com\r\n

Proxy-Connection: Keep-Alive\r\n

\r\n

Proto Init (0, 35 bytes

\* 会有TCP连接被复用



\* 会有时间上的并行

# HTTP协议的更高并行度

通常：

对于一个网站首页的访问，浏览器会先取回这个页面的**html**文件，然后解析内容，进而发起请求去取其他页面展示所需要的元素，比如图片，**css**，**js**等。

qqcom.pcap [Wireshark 1.8.0 (SVN Rev 43431 from /trunk-1.8)]

File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help

Filter: http Expression... Clear Apply Save

No.	Time	Source	src port	Destination	dest port	Protocol	Length	Info
36	4.817698	192.168.1.105	50006	111.161.48.38	80	HTTP	906	GET / HTTP/1.1
80	5.044378	192.168.1.105	50008	123.129.194.150	80	HTTP	429	GET /www/images/qq2012/qqbg_1.5.2.pr
85	5.044893	192.168.1.105	50010	123.129.194.150	80	HTTP	428	GET /www/images/qq2012/icobg_1.0.pn
90	5.047299	192.168.1.105	50011	123.129.194.150	80	HTTP	431	GET /www/images/qq2012/loginall_1.2.
99	5.060061	192.168.1.105	50012	123.129.194.150	80	HTTP	427	GET /www/images/qq2012/followme.png
100	5.060465	192.168.1.105	50013	123.129.194.150	80	HTTP	426	GET /www/images/qq2012/alphabg.png
142	5.106021	192.168.1.105	50015	122.193.23.165	80	HTTP	967	GET /promote/2012/index_55.shtml HT
149	5.111449	123.129.194.150	80	192.168.1.105	50013	HTTP	1165	HTTP/1.1 200 OK (PNG)[Malformed Pac
151	5.111975	192.168.1.105	50013	123.129.194.150	80	HTTP	428	GET /www/images/qq2012/qqlogo_1x.pn
161	5.116608	192.168.1.105	50014	123.129.194.150	80	HTTP	427	GET /www/images/qq2012/sosologo.png
170	5.122216	192.168.1.105	50017	123.129.194.178	80	HTTP	435	GET /www/pics/hv1/106/189/1135/7385
171	5.122612	192.168.1.105	50018	123.129.194.178	80	HTTP	432	GET /v/pics/hv1/108/58/1136/73883298
176	5.124363	192.168.1.105	50019	123.129.194.178	80	HTTP	432	GET /v/pics/hv1/124/74/1136/73887394
178	5.125869	192.168.1.105	50020	123.129.194.178	80	HTTP	437	GET /sports/pics/hv1/143/11/1136/738
189	5.145804	123.129.194.150	80	192.168.1.105	50010	HTTP	690	HTTP/1.1 200 OK (PNG)[Malformed Pac
205	5.158163	123.129.194.150	80	192.168.1.105	50012	HTTP	691	HTTP/1.1 200 OK (PNG)[Malformed Pac
207	5.159006	192.168.1.105	50021	58.251.58.60	80	HTTP	445	GET /images/hq_parts_little8_2/hushe
211	5.160431	192.168.1.105	50010	123.129.194.150	80	HTTP	426	GET /joke/koala/koala.min.1.3.3.js
218	5.169851	192.168.1.105	50012	123.129.194.150	80	HTTP	426	GET /www/guirenniao/guirenniao.png
277	5.219082	192.168.1.105	50022	123.129.194.178	80	HTTP	419	GET /nice_mb/5a/0c/7106.jpg HTTP/1.1
285	5.224616	192.168.1.105	50023	123.129.194.178	80	HTTP	419	GET /nice_mb/1f/32/7105.jpg HTTP/1.1
287	5.225212	192.168.1.105	50024	122.193.23.42	80	HTTP	924	GET /web/crystal/v1.8Beta08Build083/
288	5.225449	123.129.194.150	80	192.168.1.105	50011	HTTP	601	HTTP/1.1 200 OK (PNG)[Malformed Pac
294	5.233081	123.129.194.150	80	192.168.1.105	50013	HTTP	1062	HTTP/1.1 200 OK (PNG)[Malformed Pac
300	5.237452	123.129.194.150	80	192.168.1.105	50012	HTTP	518	HTTP/1.1 200 OK (PNG)[Malformed Pac
302	5.239455	123.129.194.150	80	192.168.1.105	50014	HTTP	929	HTTP/1.1 200 OK (PNG)[Malformed Pac
310	5.250459	123.129.194.178	80	192.168.1.105	50018	HTTP	254	HTTP/1.1 200 OK (image/jpeg)
312	5.251618	192.168.1.105	50018	123.129.194.178	80	HTTP	419	GET /nice_mb/29/27/7104.jpg HTTP/1.1
313	5.254490	58.251.58.60	80	192.168.1.105	50021	HTTP	993	HTTP/1.1 200 OK (PNG)
317	5.257925	123.129.194.178	80	192.168.1.105	50019	HTTP	454	HTTP/1.1 200 OK (image/jpeg)
318	5.258513	192.168.1.105	50019	123.129.194.178	80	HTTP	419	GET /nice_mb/de/aa/7103.jpg HTTP/1.1
322	5.261280	123.129.194.178	80	192.168.1.105	50020	HTTP	213	HTTP/1.1 200 OK (image/jpeg)
325	5.261781	192.168.1.105	50025	119.167.141.17	80	HTTP	433	GET /qqlive/images/20120908/11347038
329	5.265128	122.193.23.165	80	192.168.1.105	50015	HTTP	368	HTTP/1.1 200 OK (text/html)
336	5.272499	192.168.1.105	50020	123.129.194.178	80	HTTP	419	GET /nice_mb/ed/9f/7102.jpg HTTP/1.1
341	5.277654	192.168.1.105	50026	119.167.141.17	80	HTTP	433	GET /qqlive/images/20120907/11347020
374	5.302040	192.168.1.105	50027	112.90.137.52	80	HTTP	1020	GET /collect?pi=1990&dm=www.qq.com&
376	5.307459	111.161.48.38	80	192.168.1.105	50006	HTTP	315	HTTP/1.1 200 OK (text/html)
386	5.322850	123.129.194.178	80	192.168.1.105	50018	HTTP	1137	HTTP/1.1 200 OK (image/jpeg)



qqcom.pcap [Wireshark 1.8.0 (SVN Rev 43431 from /trunk-1.8)]

File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help

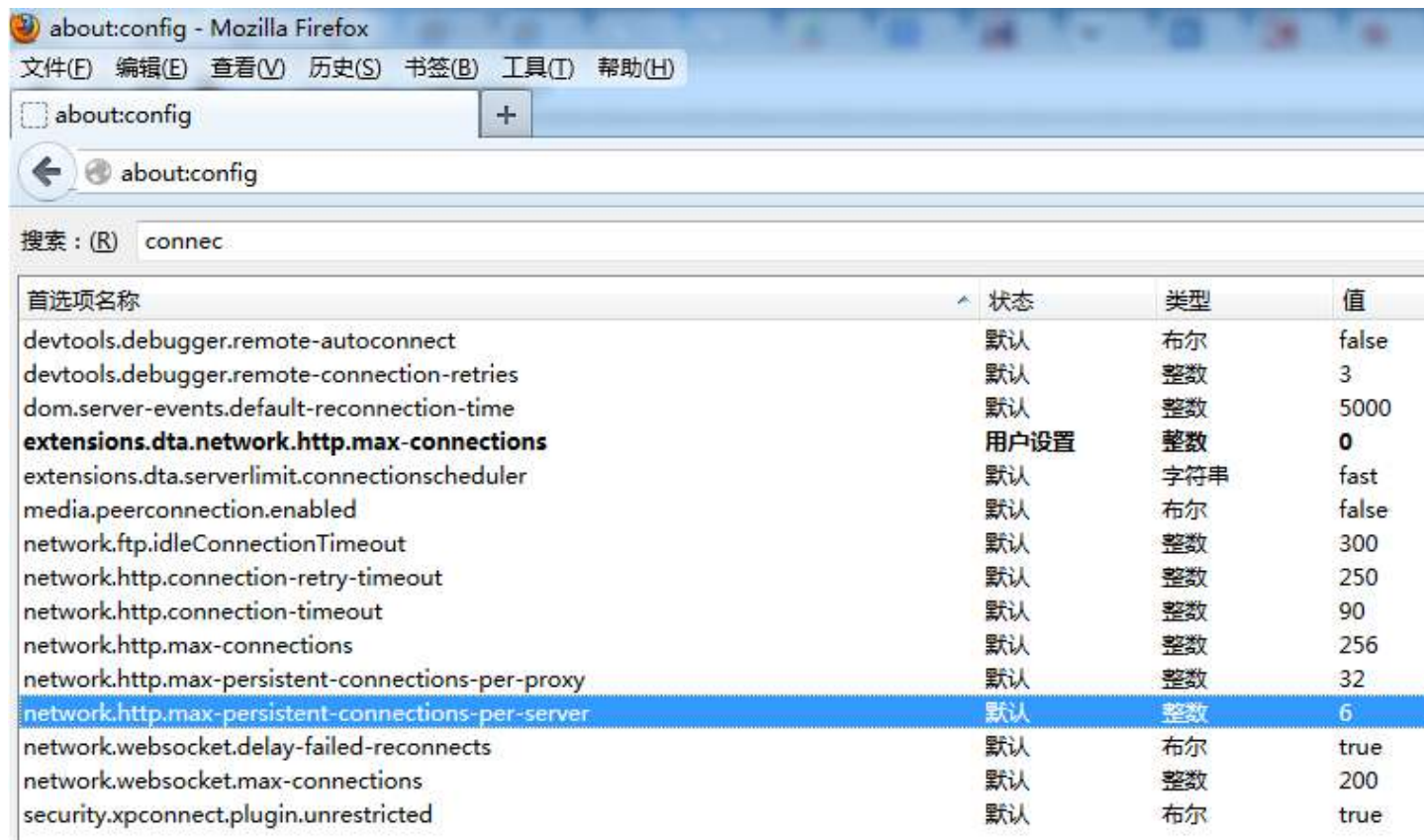
Filter: http Expression... Clear Apply Save

No.	Time	Source	src port	Destination	dest port	Protocol	Length	Info
36	4.817698	192.168.1.105	50006	111.161.48.38	80	HTTP	906	GET / HTTP/1.1
80	5.044378	192.168.1.105	50008	123.129.194.150	80	HTTP	429	GET /www/images/qq2012/qqbg_1.5
85	5.044893	192.168.1.105	50010	123.129.194.150	80	HTTP	428	GET /www/images/qq2012/icobg_1.
90	5.047299	192.168.1.105	50011	123.129.194.150	80	HTTP	431	GET /www/images/qq2012/loginall
99	5.060061	192.168.1.105	50012	123.129.194.150	80	HTTP	427	GET /www/images/qq2012/followme
100	5.060465	192.168.1.105	50013	123.129.194.150	80	HTTP	426	GET /www/images/qq2012/alphabg.
142	5.106021	192.168.1.105	50015	122.193.23.165	80	HTTP	967	GET /promote/2012/index_55.shtm
149	5.111449	123.129.194.150	80	192.168.1.105	50013	HTTP	1165	HTTP/1.1 200 OK (PNG)[Malforme
151	5.111975	192.168.1.105	50013	123.129.194.150	80	HTTP	428	GET /www/images/qq2012/qqlogo_1
161	5.116608	192.168.1.105	50014	123.129.194.150	80	HTTP	427	GET /www/images/qq2012/sosologo
170	5.122216	192.168.1.105	50017	123.129.194.178	80	HTTP	435	GET /www/pics/hv1/106/189/1135/

1. 首页约58KB, response被分成42个TCP segment返回
2. 获取了14个TCP segment (截止Frame #75) 后, 开始发起内嵌资源的请求 (Frame #80)
3. 到Frame #376, 整个首页html返回完成。

# 现实中的浏览器的并行度

IE 6 and 7:	2
IE 8:	6
IE 9:	6
IE 10:	8
Firefox 2:	2
Firefox 3:	6
Firefox 4 to 17:	6
Opera 9.63:	4
Opera 10:	8
Opera 11 and 12:	6
Chrome 1 and 2:	6
Chrome 3:	4
Chrome 4 to 23:	6
Safari 3 and 4:	4



The screenshot shows the 'about:config' page in Mozilla Firefox. The search bar contains 'connec'. The table below lists various configuration options related to network connections.

首选项名称	状态	类型	值
devtools.debugger.remote-autoconnect	默认	布尔	false
devtools.debugger.remote-connection-retries	默认	整数	3
dom.server-events.default-reconnection-time	默认	整数	5000
<b>extensions.dta.network.http.max-connections</b>	用户设置	整数	<b>0</b>
extensions.dta.serverlimit.connectionscheduler	默认	字符串	fast
media.peerconnection.enabled	默认	布尔	false
network.ftp.idleConnectionTimeout	默认	整数	300
network.http.connection-retry-timeout	默认	整数	250
network.http.connection-timeout	默认	整数	90
network.http.max-connections	默认	整数	256
network.http.max-persistent-connections-per-proxy	默认	整数	32
<b>network.http.max-persistent-connections-per-server</b>	默认	整数	<b>6</b>
network.websocket.delay-failed-reconnects	默认	布尔	true
network.websocket.max-connections	默认	整数	200
security.xpconnect.plugin.unrestricted	默认	布尔	true

# HTTP 代理

代理的主要作用:

- 共用外网IP，通过代理上网
- 匿名访问
- 安全策略强制，URL/内容过滤
- 反URL过滤（翻墙）
- 通过代理缓存，加快上网速度
- 流量获取和分析 (fiddler等工具)



# HTTP 代理的工作方式

对于Web客户端来说，代理扮演的是服务器的角色，接收Request，返回Response

对于Web服务器来说，代理扮演的是客户端的角色，发送Request，接收Response



代理可以嵌套，多级代理。

# 从TCP连接层面看代理

Fiddler.exe:4484 Properties

Image Performance Performance Graph Disk and Network GPU Graph Threads TCP/IP Security Environment .NET Assemblies

☒ Resolve addresses

Protocol	Local Address	Remote Address	State
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38062	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:37991	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38065	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38066	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38006	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38010	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38034	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:37999	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38000	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38001	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38002	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38003	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38004	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38005	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38006	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38010	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38011	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:38007	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:8888	rickyqiu-nb.tencent.com:37985	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:38009	101.226.49.43:http	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:38012	61.155.220.184:http	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:38013	61.155.220.184:http	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:38014	61.155.220.184:http	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:38015	61.155.220.184:http	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:38016	61.155.220.184:http	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:38017	61.155.220.184:http	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:38018	222.73.3.34:http	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:38019	183.60.217.29:http	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:38031	111.177.111.197:http	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:38038	111.177.111.197:http	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:38039	121.14.76.225:http	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:38045	183.60.217.29:http	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:38046	183.60.217.29:http	ESTABLISHED
TCP	rickyqiu-nb.tencent.com:38047	222.73.3.39:http	ESTABLISHED

Fiddler Options

General HTTPS Connections Gateway Appearance Extensions Tools

Fiddler can debug traffic from any application that accepts a HTTP Proxy. A through Fiddler when "File > Capture Traffic" is checked.

Fiddler listens on port: **8888**

☒ Act as system proxy on

[Copy Browser Proxy Configuration URL](#)

☒ Monitor all connections

☐ Capture FTP requests

☒ Default LAN

Internet 选项

局域网(LAN)设置

自动配置  
自动配置会覆盖手动设置。要确保使用手动设置，请禁用自动配置。

☐ 自动检测设置(A)

☐ 使用自动配置脚本(S)

地址(R):

代理服务器

☒ 为 LAN 使用代理服务器(这些设置不用于拨号或 VPN 连接)(X)

地址: 端口(T): 高级(C)

☐ 对于本地地址不使用代理服务器(B)

代理设置

服务器

类型	要使用的代理服务器地址	端口
HTTP(H):	127.0.0.1	8888
安全(S):	127.0.0.1	8888

# HTTP代理配置 – PAC文件方式

- PAC文件是纯文本格式的，实际上就是JavaScript文件。

一般公司用PAC文件的方式来便于代理的灵活配置。

# HTTP代理可能带来的问题

- 服务器无法直接看到最初发起请求的client的IP，定位不准。
- Client无法知道真正提供服务的Web Server的IP
- 代理对HTTP内容处理不好会导致错误
- 代理本身的性能问题
- 隐私问题

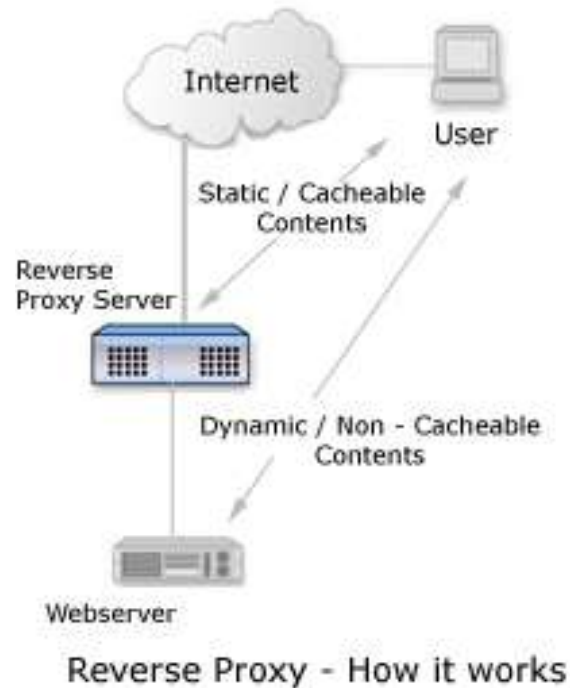
除了代理，还有 反向代理...

# HTTP 反向代理

- 代理(Proxy): 靠近客户端, 替初始的客户端把请求发送出去, 对外表现为一个客户端。
- 反向代理 (Reverse Proxy): 靠近服务器

反向代理服务器来接受internet上的连接请求, 然后将请求转发给内部网络上的服务器, 并将从服务器上得到的结果返回给internet上请求连接的客户端, 此时代理服务器对外就表现为一个服务器。

🌈 反向代理通常用于缓存和负载均衡。



# HTTP – CDN(Content Delivery Network)

- CDN最基本的想法是让互联网内容更靠近用户，提供快速的分发和分布式高带宽的支持。
- 分为公用CDN（akamai，蓝汛等）和自建CDN(腾讯，淘宝等)



CDN通常用来提供不需要计算处理的静态资源，比如图片，JS, CSS，视频，音乐等。

<http://img1.icson.com/product/pic200/31/136/31-136-55521.jpg>

```
管理员: C:\Windows\system32\cmd.exe - nslookup
D:\>nslookup
默认服务器:  gm-saturn.tencent.com
Address:  10.1.160.150

> img1.icson.com
服务器:  gm-saturn.tencent.com
Address:  10.1.160.150

非权威应答:
名称:      img2.icson.tcdn.qq.com
Addresses:  222.73.3.34
            61.155.220.184
            183.60.217.29
            183.60.217.30
            183.60.217.55
            183.60.217.57
            183.60.217.58
            220.169.154.157
            222.73.3.32
            222.73.3.33
Aliases:   img1.icson.com
            img2.icson.tc.qq.com
```

IP地址(222.73.3.34)查询结果: 上海市 电信(外高桥)IDC机房

IP地址(61.155.220.184)查询结果: 江苏省苏州市昆山市 电信

IP地址(183.60.217.29)查询结果: 广东省深圳市 电信IDC机房



# HTTP数据压缩

- 通常针对文本的内容
- 需要Web Server支持
- 需要浏览器声称支持

nginx中关于压缩的设置

```
gzip                on;
gzip_comp_level     2;                                # 压缩比例，比例越大，
gzip_types          text/css text/javascript;         # 哪些文件可以被压缩
gzip_disable        "MSIE [1-6]\.";                  # IE6对脚本压缩支持不好
```

取样器结果	请求	响应数据
GET http://www.51buy.com/		
[no cookies]		
Request Headers:		
Connection: keep-alive		
User-Agent: Mozilla/5.0 (compatible; MSIE 9.0; Windows NT 6.1; Trident/5.0)		
Accept-Encoding: gzip, deflate		
Host: www.51buy.com		

取样器结果	请求	响应数据
Thread Name: 线程组 1-1		
Sample Start: 2013-06-16 17:08:57 CST		
Load time: 64		
Latency: 50		
Size in bytes: 28304		
Headers size in bytes: 476		
Body size in bytes: 27828		
Sample Count: 1		
Error Count: 0		
Response code: 200		
Response message: OK		

取样器结果	请求	响应数据
GET http://www.51buy.com/		
[no cookies]		
Request Headers:		
Connection: keep-alive		
User-Agent: Mozilla/5.0 (compatible; MSIE 9.0; Windows NT 6.1; Trident/5.0)		
Host: www.51buy.com		

取样器结果	请求	响应数据
Sample Start: 2013-06-16 17:09:09 CST		
Load time: 120		
Latency: 34		
Size in bytes: 142891		
Headers size in bytes: 452		
Body size in bytes: 142439		
Sample Count: 1		
Error Count: 0		
Response code: 200		
Response message: OK		

# HTTP本地缓存

## HTTP缓存相关的Header

### Request

Cache-Control: max-age=0	以秒为单位
If-Modified-Since: Mon, 19 Nov 2012 08:38:01 GMT	缓存文件的最后修改时间。
If-None-Match: "0693f67a67cc1:0"	缓存文件的Etag值
Cache-Control: no-cache	不使用缓存
Pragma: no-cache	不使用缓存

### Response

Cache-Control: public	响应被缓存，并且在多用户间共享，（公有缓存和私有缓存的区别，请看另一节）
Cache-Control: private	响应只能作为私有缓存，不能在用户之间共享
Cache-Control: no-cache	提醒浏览器要从服务器提取文档进行验证
Cache-Control: no-store	绝对禁止缓存（用于机密，敏感文件）
Cache-Control: max-age=60	60秒之后缓存过期（相对时间）
Date: Mon, 19 Nov 2012 08:39:00 GMT	当前response发送的时间
Expires: Mon, 19 Nov 2012 08:40:01 GMT	缓存过期的时间（绝对时间）
Last-Modified: Mon, 19 Nov 2012 08:38:01 GMT	服务器端文件的最后修改时间
ETag: "20b1add7ec1cd1:0"	服务器端文件的Etag值


# HTTP缓存 – 检查更新(不确定是否可以直接用本地缓存)





- 初次访问或者强制刷新（Ctrl + F5）
- 忽略缓存，也不带If-Modified-Since


Elements Resources Network Sources Timeline Profiles Audits Console PageSpeed


Name  
Path


 01-266-022.jpg  
img2.icson.com/product/pic160/01/266


 19-419-15384.jpg  
img2.icson.com/product/pic160/19/419


 21-073-10044.jpg  
img2.icson.com/product/pic160/21/073


 jquery-1.5.1.min.js  
st.icson.com/static\_v1/js


 23-819-024.jpg  
img2.icson.com/product/pic160/23/819

 01-144-268.jpg  
img2.icson.com/product/pic160/01/144

 24-104-189.jpg  
img1.icson.com/product/pic160/24/104

 about:blank

 toolbar\_dot.png  
static.gtimg.com/icson/img/index/v0

 getpanel?id=188&vb2ctag=1\_45\_3\_1139&width...

Headers Preview Response Cookies Timing

Request URL: http://st.icson.com/static\_v1/js/jquery-1.5.1.min.js  
Request Method: GET  
Status Code: 200 OK

Request Headers  
view source  
Accept: /\*/\*  
Accept-Encoding: gzip, deflate, sdch  
Accept-Language: en-US,en;q=0.8  
Cache-Control: no-cache  
Connection: keep-alive  
Cookie: ts\_refer=buy.51buy.com/order.html; pgv\_pvid=9594351164; ts\_uid=5624070491  
Host: st.icson.com  
Pragma: no-cache  
Referer: http://www.51buy.com/  
User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/2

Response Headers  
view source  
Cache-Control: max-age=0  
Connection: keep-alive  
Content-Encoding: gzip  
Content-Length: 32572  
Content-Type: application/x-javascript  
Last-Modified: Tue, 06 Sep 2011 05:57:13 GMT  
Server: NWS\_icson\_HY

## 🌈 后续访问

🌈 请求中带上上次服务器返回的**Last Modified**时间

🌈 如果服务器发现没有更新，返回**304**，只有**header**，无**body**

The screenshot shows the Chrome DevTools Network tab. The left pane lists resources, with `jquery-1.5.1.min.js` from `st.icson.com/static_v1/js` highlighted with a red box. The right pane shows the headers for this request. The **Status Code** is `304 Not Modified`, highlighted with a red box. The **If-Modified-Since** header is `Tue, 06 Sep 2011 05:57:13 GMT`, highlighted with a blue box. The **Response Headers** section shows `Cache-Control: max-age=0`, `Content-Type: application/x-javascript`, and `Server: NWS_icson_HY`.

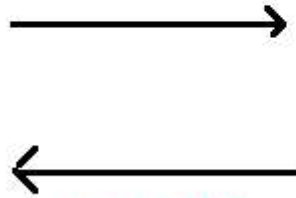
Name	Path	Headers
g0.css?t=20130607152826	static.gtimg.com/icon/css/common/v0	
23-819-024.jpg	img2.icson.com/product/pic160/23/819	
19-419-15384.jpg	img2.icson.com/product/pic160/19/419	
21-073-10044.jpg	img2.icson.com/product/pic160/21/073	
01-144-268.jpg	img2.icson.com/product/pic160/01/144	
01-266-022.jpg	img2.icson.com/product/pic160/01/266	
39-106-966.jpg	img2.icson.com/product/pic160/39/106	
24-104-189.jpg	img1.icson.com/product/pic160/24/104	
jquery-1.5.1.min.js	st.icson.com/static_v1/js	<b>Status Code: 304 Not Modified</b> <b>If-Modified-Since: Tue, 06 Sep 2011 05:57:13 GMT</b>
global.js?v=2013060401	st.icson.com/static_v1/js	

# HTTP缓存 – 直接使用本地缓存（有效期内）

缓存命中



浏览器



使用缓存对象



缓存



Web服务器

- 初次访问或者强制刷新（Ctrl + F5）
  - 服务器返回有效期

The screenshot displays the Chrome DevTools Network tab. The left sidebar lists network resources, with the selected resource being a CSS file: `gb.css?t=20130607152826` from `static.gting.com/icon/css/common/v0`. The right pane shows the details for this request, including the Request URL, Request Method (GET), Status Code (200 OK), Request Headers, Query String Parameters, and Response Headers. The `Cache-Control` header in the Response Headers is highlighted, showing `max-age=31536000`.

Name	Path	Headers	Preview	Response	Timing
www.51buy.com					
gb.css?t=20130607152826	static.gting.com/icon/css/common/v0				
index.css?t=20130605152215	static.gting.com/icon/css/index/v0				
1_big20121211161506221392.jpg	img2.icson.com/ICSONAD/201212				
1_big20130207092008428454.jpg	img2.icson.com/ICSONAD/201302				
39-106-966.jpg	img2.icson.com/product/pic160/39/106				
01-266-022.jpg	img2.icson.com/product/pic160/01/266				
19-419-15384.jpg	img2.icson.com/product/pic160/19/419				
21-073-10044.jpg	img2.icson.com/product/pic160/21/073				
jquery-1.5.1.min.js	st.icson.com/static_v1/js				
23-819-024.jpg					

**Request URL:** `http://static.gting.com/icon/css/common/v0/gb.css?t=20130607152826`  
**Request Method:** GET  
**Status Code:** 200 OK

**Request Headers**

- Accept: text/css,\*/\*;q=0.1
- Accept-Encoding: gzip,deflate,sdch
- Accept-Language: en-US,en;q=0.8
- Cache-Control: no-cache
- Connection: keep-alive
- Host: static.gting.com
- Pragma: no-cache
- Referer: `http://www.51buy.com/`
- User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrom

**Query String Parameters**

- t: 20130607152826

**Response Headers**

- Cache-Control: max-age=31536000
- Connection: keep-alive
- Content-Encoding: gzip
- Content-Length: 17863
- Content-Type: text/css
- Date: Sun, 16 Jun 2013 09:47:56 GMT
- Expires: Mon, 16 Jun 2014 09:47:56 GMT
- Last-Modified: Fri, 31 May 2013 06:54:12 GMT
- Server: NWS\_paipai\_HY

## 后续访问

- 浏览器发现在有效期内，直接使用本地缓存。
- 不发送HTTP请求

The screenshot shows the Chrome DevTools Network tab. The left pane lists network resources, with 'gb.css?t=20130607152826' from 'static.gtimg.com' highlighted. The right pane shows the details for this request, including the status code '200 OK (from cache)' and the 'Cache-Control: max-age=31536000' response header, both of which are highlighted with red boxes. The 'Expires' header is also visible, indicating the cache validity period.

Name	Path	Headers	Preview	Response
www.51buy.com				
gb.css?t=20130607152826	static.gtimg.com/icson/css/common/v0	Request URL: http://static.gtimg.com/icson/css/common/v0/gb.css?t=20130607152826 Request Method: GET Status Code: 200 OK (from cache)		
index.css?t=20130605152215	static.gtimg.com/icson/css/index/v0			
23-819-024.jpg	img2.icson.com/product/pic160/23/819			
01-144-268.jpg	img2.icson.com/product/pic160/01/144			
21-073-10044.jpg	img2.icson.com/product/pic160/21/073			
19-419-15384.jpg	img2.icson.com/product/pic160/19/419			
01-266-022.jpg	img2.icson.com/product/pic160/01/266			
24-104-189.jpg	img1.icson.com/product/pic160/24/104			
39-106-966.jpg	img2.icson.com/product/pic160/39/106			
1_big20130207092008428454.jpg				

**Request Headers**

- Accept: text/css,\*/\*;q=0.1
- Accept-Encoding: gzip,deflate,sdch
- Accept-Language: en-US,en;q=0.8
- Cache-Control: no-cache
- Connection: keep-alive
- Host: static.gtimg.com
- Pragma: no-cache
- Referer: http://www.51buy.com/
- User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko)

**Query String Parameters**

- t: 20130607152826

**Response Headers**

- Cache-Control: max-age=31536000
- Connection: keep-alive
- Content-Encoding: gzip
- Content-Length: 17863
- Content-Type: text/css
- Date: Sun, 16 Jun 2013 09:47:56 GMT
- Expires: Mon, 16 Jun 2014 09:47:56 GMT
- Last-Modified: Fri, 31 May 2013 06:54:12 GMT
- Server: NWS\_paipai\_HY



# HTTP相关测试推荐工具

- Firebug（firefox插件，HTTP流量分析）
- Chrome toolbar（Chrome自带分析工具）
- HttpWatch（第三方HTTP分析工具）
- Fiddler（独立的抓包和分析工具）
- Wireshark（通用的网络层抓包）
- Jmeter（通用的性能和自动化测试工具，开源）
- Curl（命令行网络工具，也有各语言的curllib）

# 参考资料:

- RFC
  - HTTP 1.1 - <http://tools.ietf.org/html/rfc2616>
  - 'text/html' Media Type - <http://www.ietf.org/rfc/rfc2854.txt>
- Blogs
  - <http://www.cnblogs.com/li0803/archive/2008/11/03/1324746.html>
  - <http://www.cnblogs.com/TankXiao>
  - <http://blog.csdn.net/emu>
  - <http://zsxxsz.iteye.com/blog/568250>
- Books
  - 构建高性能WEB站点
  - 高性能网站（High Performance Web Sites）
  - 更快速网站（Even Faster Web Sites）