Marco Cecconi

High perf architecture

Twitter: @sklivvz Blog: http://sklivvz.com

Follow along

Architecture:

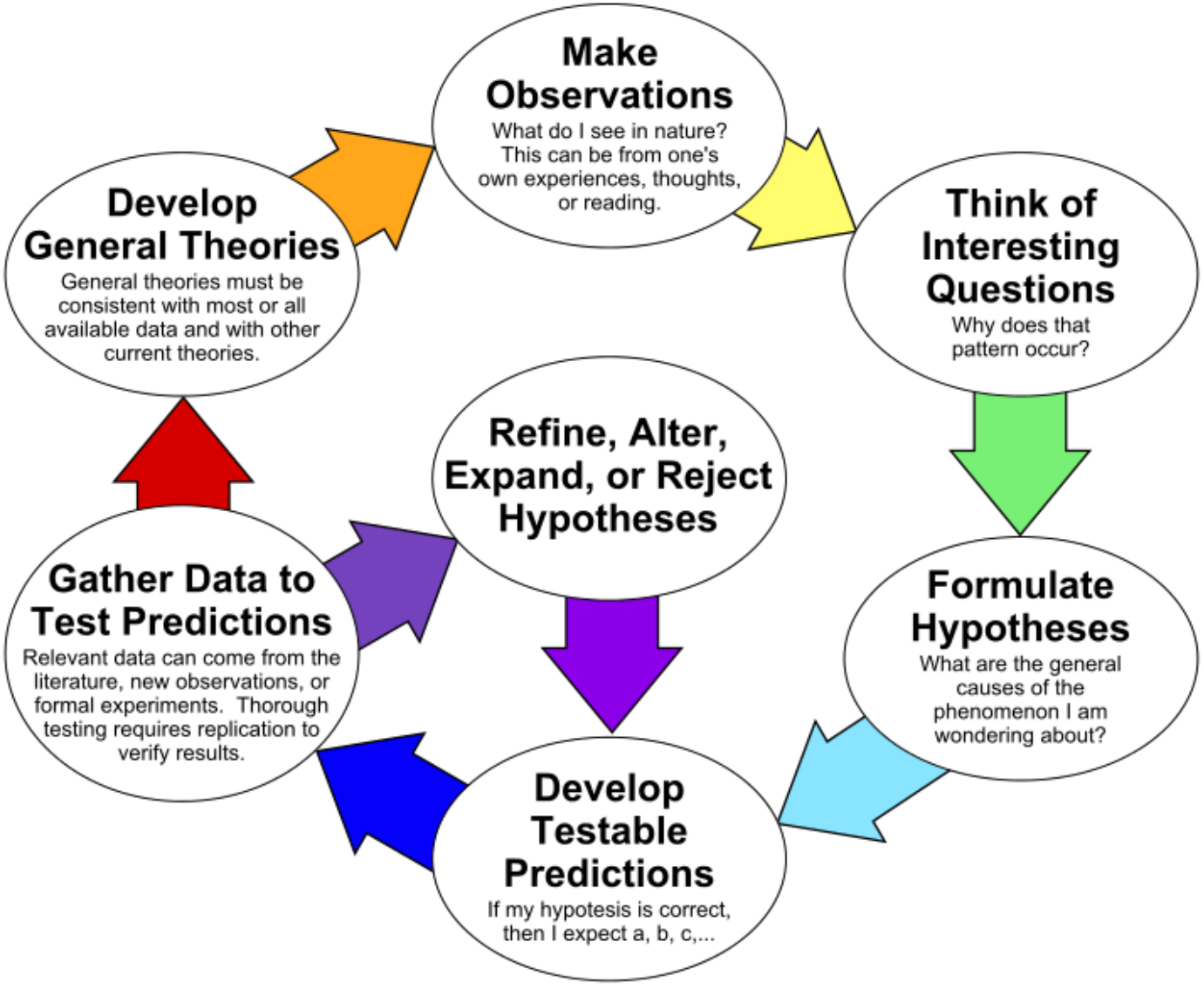
1. the art or science of building; *specifically* : the art or practice of designing and building structures and especially habitable ones

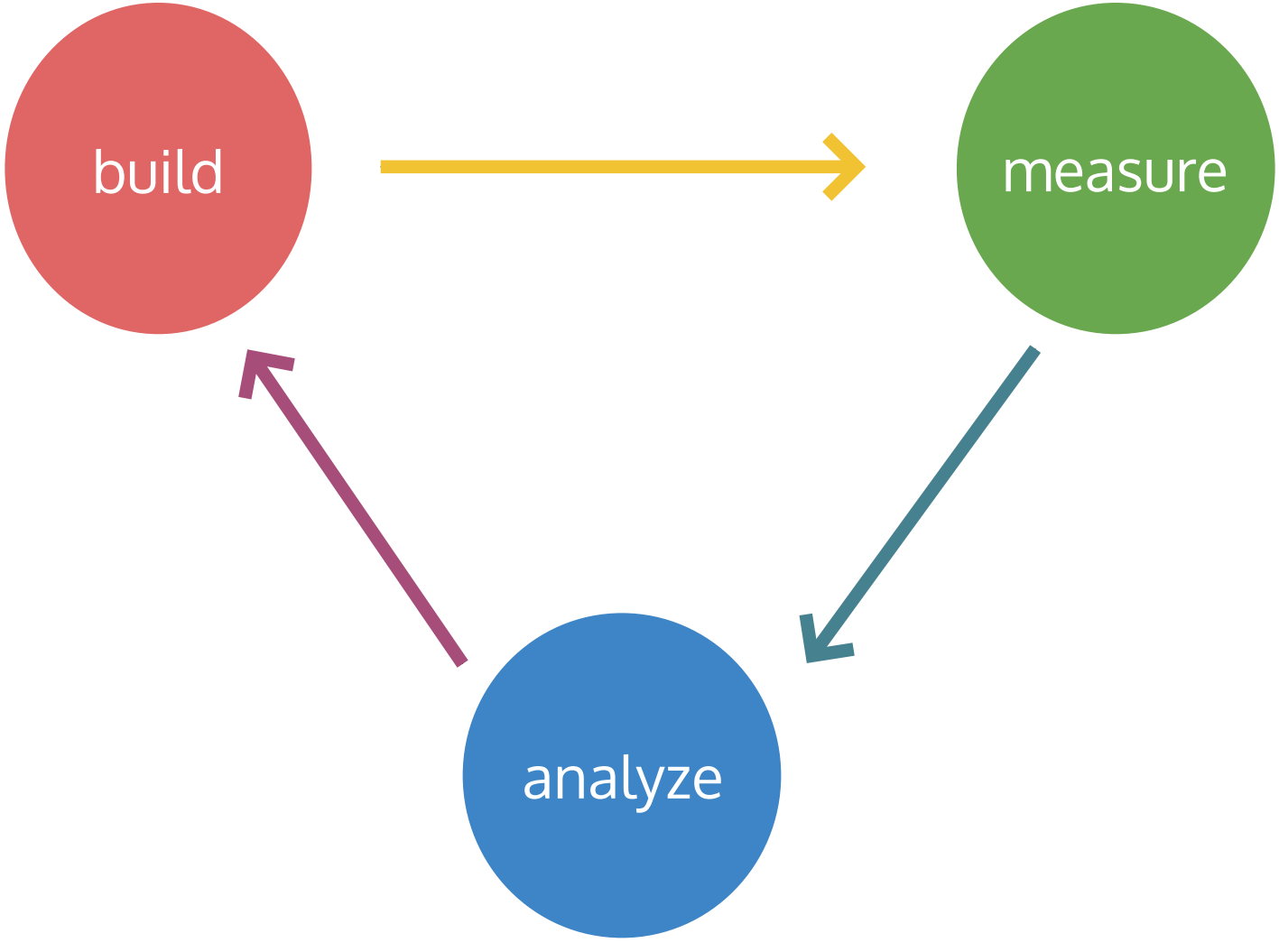
- Durability
- Utility
- Beauty

Performance:

1. (*efficiency*) the ability to do something or produce something without wasting materials, time, or energy

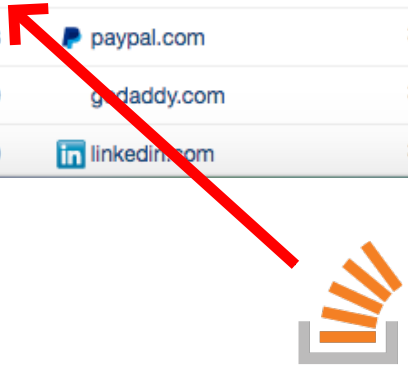
The Scientific Method as an Ongoing Process




build
measure
analyze

Santelle della Val Taleggio - www.valbrembanaweb.com

RANK	SITE	MONTHLY PEOPLE
1	google.com	235,230,320
2	youtube.com	204,892,336
3	facebook.com	148,510,880
4	msn.com	142,251,456
5	bing.com	116,038,360
6	yahoo.com	108,290,000
7	amazon.com	94,959,056
8	twitter.com	91,830,568
9	ebay.com	82,584,696
10	yelp.com	77,567,040
11	live.com	58,735,832
12	microsoft.com	58,302,040
13	buzzfeed.com	56,997,960
14	netflix.com	56,602,660
15	pinterest.com	49,656,916
16	wikia.com	41,264,544
17	wikipedia.org	39,633,696
18	paypal.com	38,511,168
19	godaddy.com	37,978,120
20	linkedin.com	37,472,296



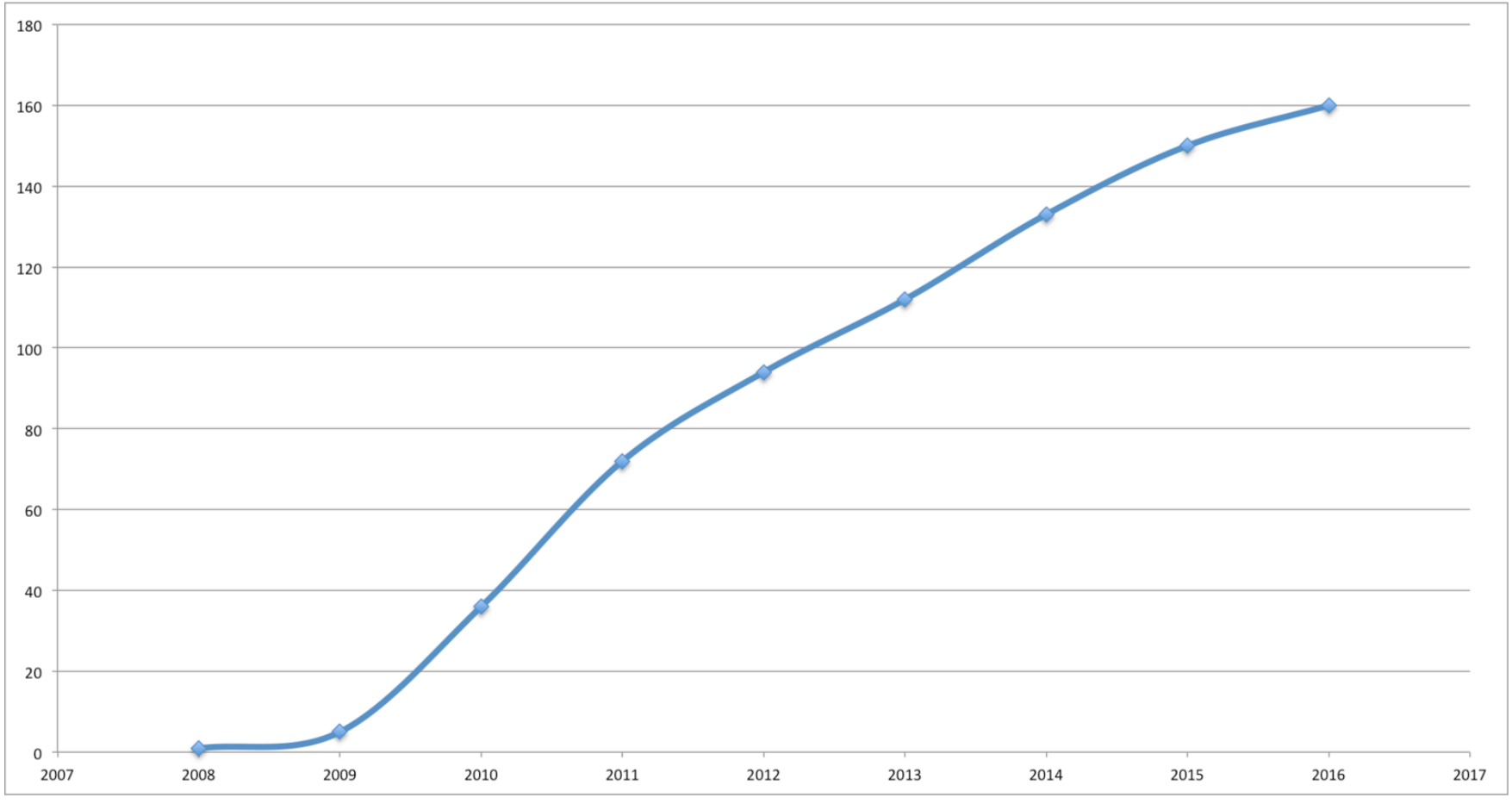
North Korea accidentally lets world access its internet and it only has 28 websites

Arjun Kharpal | @ArjunKharpal

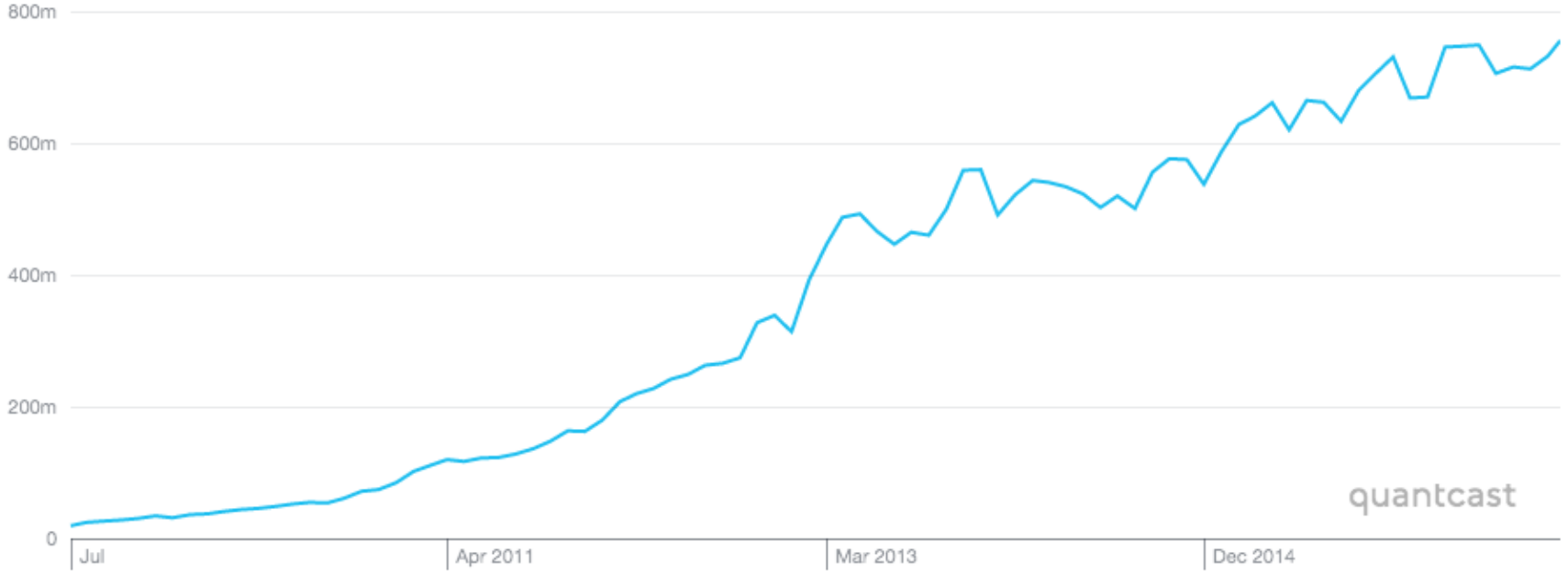
Wednesday, 21 Sep 2016 | 4:53 AM ET

RANK	SITE	MONTHLY PEOPLE
1	stackoverflow.com	244
2	stackexchange.com	115
3	Hidden profile	—
4	askubuntu.com	62
5	filehippo.com	61
6	superuser.com	58
7	howtogeek.com	36
8	sciencedaily.com	27
9	serverfault.com	24
10	instructables.com	23

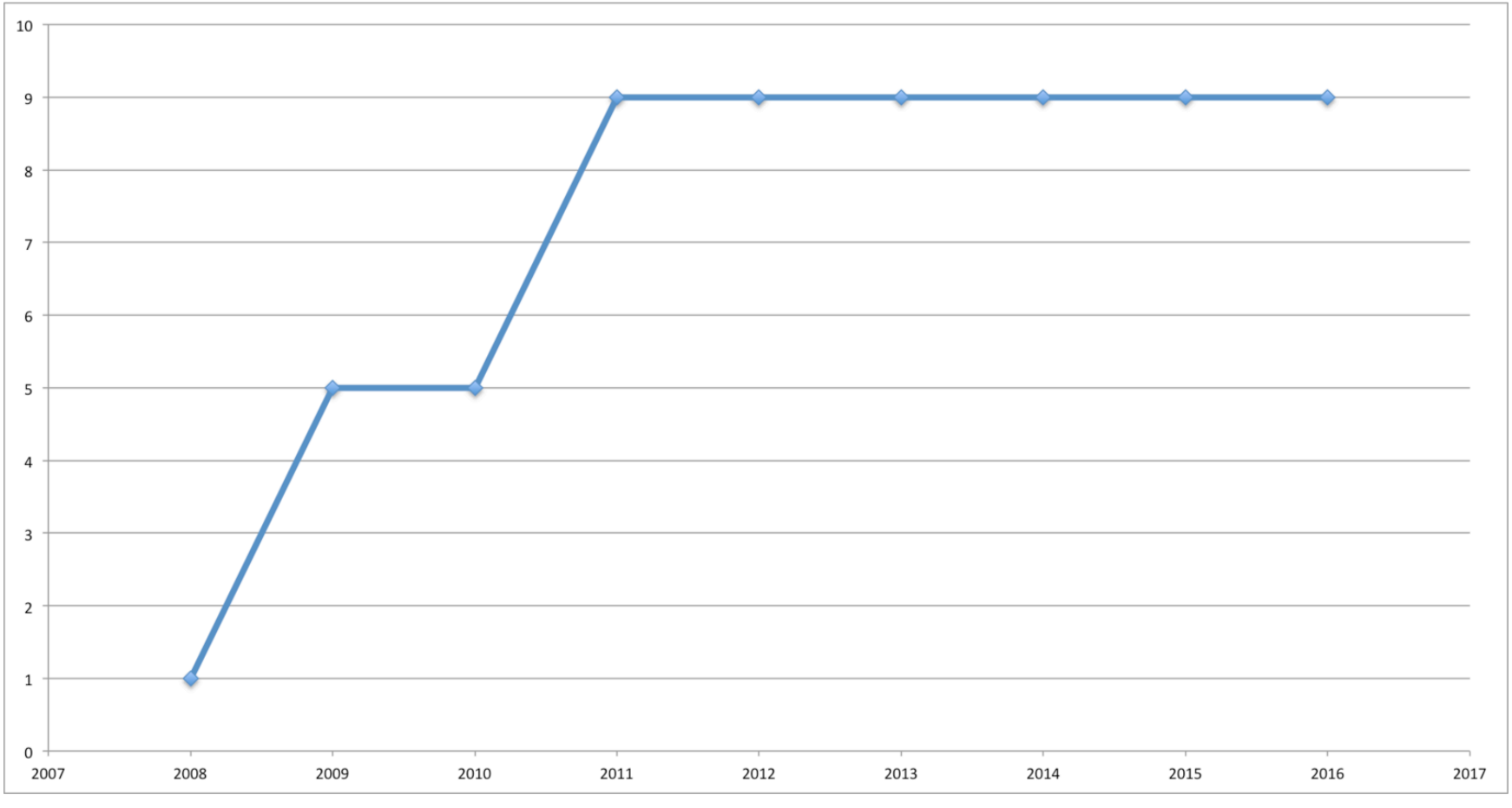
Stack Exchange network (sites)

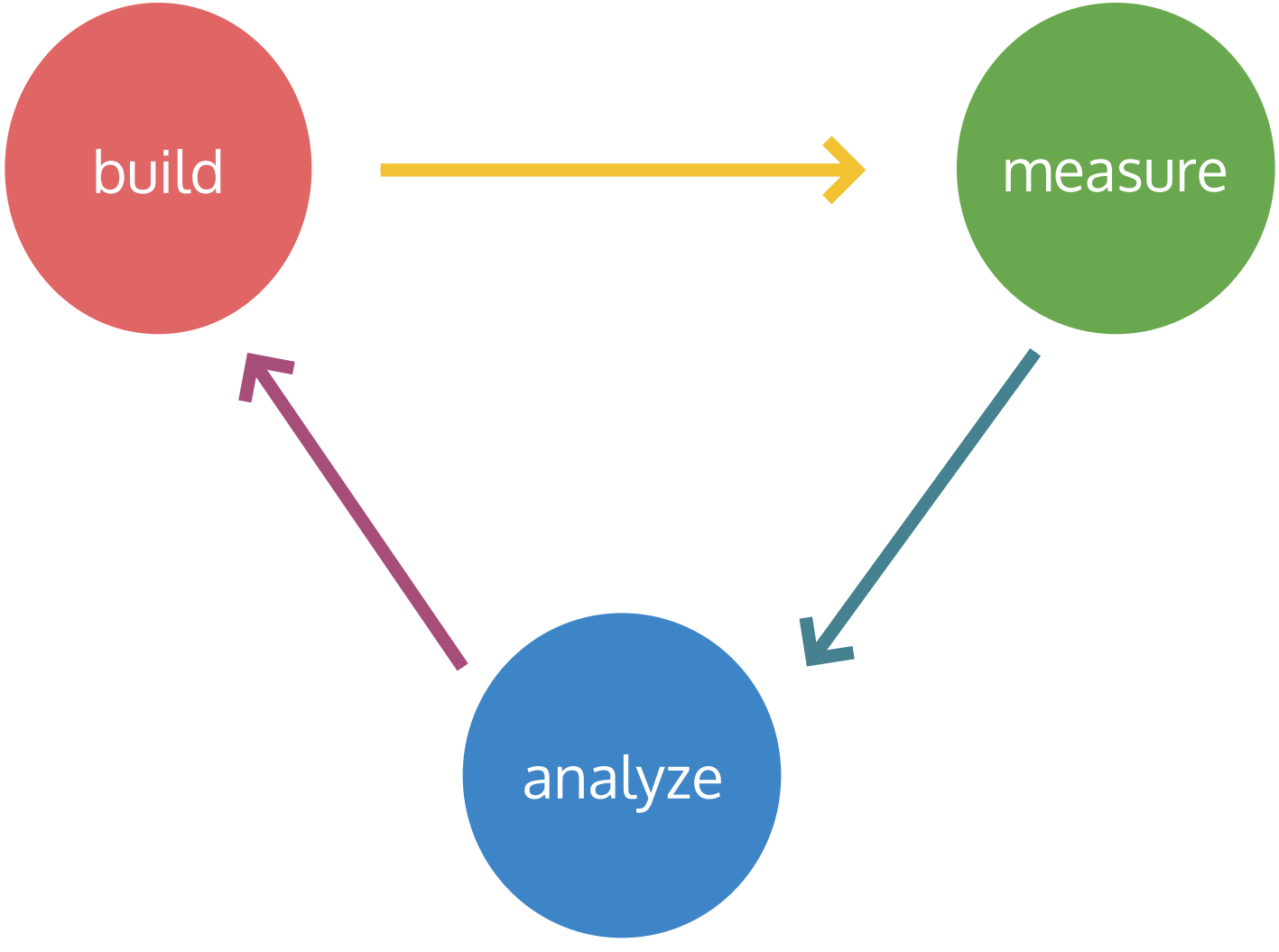


Stack Exchange network (pageviews)

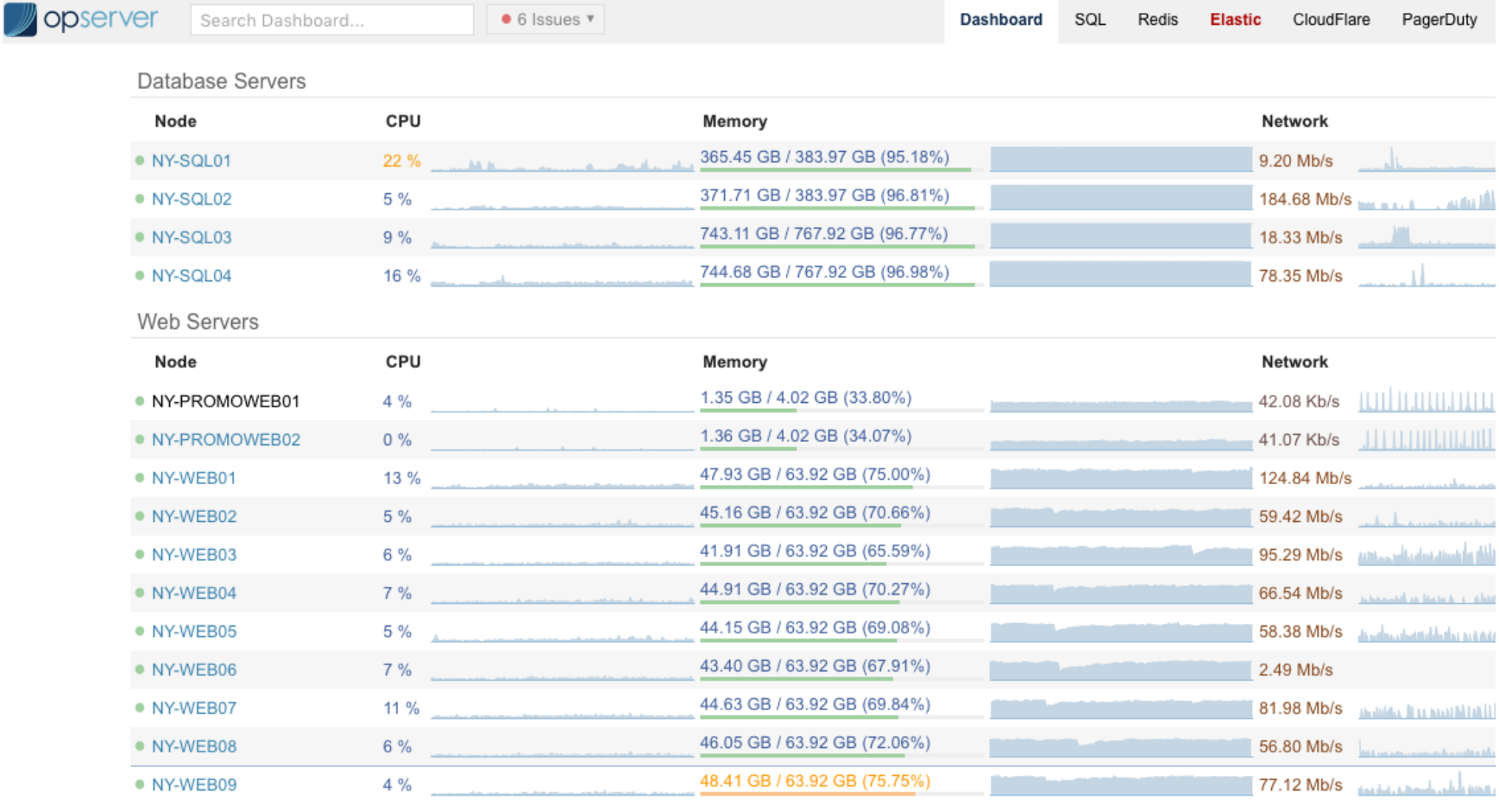


Stack Exchange network (web servers)

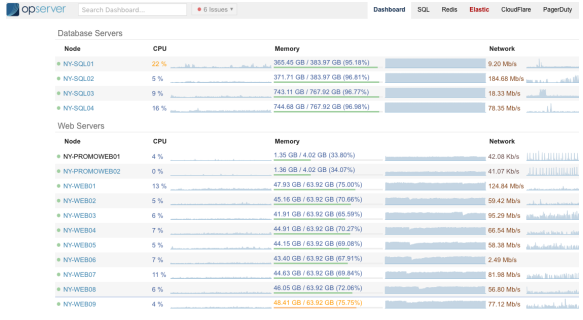



build
measure
analyze

PowerEdge R610
PowerEdge R310
PowerEdge R610
PowerEdge R610
PowerEdge R620


opserver
Search Dashboard...
6 Issues
Dashboard
SQL
Redis
Elastic
CloudFlare
PagerDuty
Database Servers
Node
CPU
Memory
Network
NY-SQL01
22 %
365.45 GB / 383.97 GB (95.18%)
9.20 Mb/s
NY-SQL02
5 %
371.71 GB / 383.97 GB (96.81%)
184.68 Mb/s
NY-SQL03
9 %
743.11 GB / 767.92 GB (96.77%)
18.33 Mb/s
NY-SQL04
16 %
744.68 GB / 767.92 GB (96.98%)
78.35 Mb/s
Web Servers
Node
CPU
Memory
Network
NY-PROMOWEB01
4 %
1.35 GB / 4.02 GB (33.80%)
42.08 Kb/s
NY-PROMOWEB02
0 %
1.36 GB / 4.02 GB (34.07%)
41.07 Kb/s
NY-WEB01
13 %
47.93 GB / 63.92 GB (75.00%)
124.84 Mb/s
NY-WEB02
5 %
45.16 GB / 63.92 GB (70.66%)
59.42 Mb/s
NY-WEB03
6 %
41.91 GB / 63.92 GB (65.59%)
95.29 Mb/s
NY-WEB04
7 %
44.91 GB / 63.92 GB (70.27%)
66.54 Mb/s
NY-WEB05
5 %
44.15 GB / 63.92 GB (69.08%)
58.38 Mb/s
NY-WEB06
7 %
43.40 GB / 63.92 GB (67.91%)
2.49 Mb/s
NY-WEB07
11 %
44.63 GB / 63.92 GB (69.84%)
81.98 Mb/s
NY-WEB08
6 %
46.05 GB / 63.92 GB (72.06%)
56.80 Mb/s
NY-WEB09
4 %
48.41 GB / 63.92 GB (75.75%)
77.12 Mb/s

	A	B	C	D	E	F	G	H	I	J	K	L
1								Approx 12 Months			Approx 24 Mo	
2	Table	Rows	Reserved (KB)	Data (KB)	IndexSize (KB)	Unused (KB)	Projected Growth Factor: 48 Mon	Reserved Proj (KB)	Data Proj (KB)	Index Proj (KB)	Reserved Proj (KB)	Data Proj (I
3	Applications	1	32	24	8	0	(Avg)	46	34	11	91	
4	BadgeReasonTypes	4	16	8	8	0	(Avg)	23	11	11	46	
5	Badges	899	624	328	96	200	(Avg)	890	468	137	1,780	
6	Blacklist	5	16	8	8	0	(Avg)	23	11	11	46	
7	BlacklistTypes	6	16	8	8	0	(Avg)	23	11	11	46	
8	CloseReasons	5	16	8	8	0	(Avg)	23	11	11	46	
9	Comments2Votes	1,703,245	196,944	132,096	63,840	1,008	(Avg)	280,905	188,411	91,056	561,810	37
10	EditSuggestions	0	0	0	0	0	(Avg)	0	0	0	0	
11	FrontPageCustomisationScript	114	712	568	40	104	(Avg)	1,016	810	57	2,031	
12	Log	2,933	1,816	1,240	96	480	(Avg)	2,590	1,769	137	5,180	
13	LogTypes	2	16	8	8	0	(Avg)	23	11	11	46	
14	Messages	382,438	380,768	345,296	28,936	6,536	(Avg)	543,097	492,503	41,272	1,086,194	98
15	MessageTypes	11	16	8	8	0	(Avg)	23	11	11	46	
16	Migrations	109	88	24	64	0	(Avg)	126	34	91	251	
17	ModeratorElections	0	0	0	0	0	(Avg)	0	0	0	0	
18	ModeratorMessages	27,004	8,968	6,640	2,064	264	(Avg)	12,791	9,471	2,944	25,582	1
19	PollOptions	0	0	0	0	0	(Avg)	0	0	0	0	
20	PollOptions2Votes	0	0	0	0	0	(Avg)	0	0	0	0	
21	Polls	0	0	0	0	0	(Avg)	0	0	0	0	
22	PostComments	4,985,865	4,960,128	2,086,312	2,870,888	2,928	(Avg)	7,074,729	2,975,748	4,094,805	14,149,458	5,95
23	PostHistory	9,711,396	25,669,704	13,145,432	12,515,544	8,728	5.625	36,098,021	18,485,764	17,599,984	72,196,043	36,97
24	PostHistoryTypes	22	16	8	8	0	(Avg)	23	11	11	46	
25	PostLinks	30,293,460	3,716,480	1,833,312	1,878,608	4,560	(Avg)	5,300,889	2,614,889	2,679,496	10,601,778	5,22
26	PostMigrationHistory	1,476	14,776	11,664	152	2,960	(Avg)	21,075	16,637	217	42,151	3
27	PostReferrals	277,702	38,832	38,072	256	504	(Avg)	55,387	54,303	365	110,774	10
28	Posts	4,595,371	13,513,760	8,700,656	4,787,664	25,440	5.268	17,797,622	11,458,764	6,305,353	35,595,244	22,91
29	Posts2Votes	10,862,067	5,649,648	1,128,040	4,516,944	4,664	5.264	7,434,937	1,484,501	5,944,298	14,869,874	2,96
30	PostTags	3,774,118	499,384	176,008	322,320	1,056	(Avg)	712,281	251,044	459,731	1,424,563	50
31	PostTypes	3	16	8	8	0	(Avg)	23	11	11	46	
32	PrivilegeTypeNotifications	786,315	43,224	22,640	20,320	264	(Avg)	61,651	32,292	28,983	123,302	6



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1								Approx 12 Months			Approx 24 Mo	
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17	ModeratorElections	0	0	0	0	0	(Avg)	0	0	0	0	
18	ModeratorMessages	27,004	8,968	6,640	2,064	264	(Avg)	12,781	9,471	2,944	25,182	1
19	PollOptions	0	0	0	0	0	(Avg)	0	0	0	0	
20	PollOptions2Votes	0	0	0	0	0	(Avg)	0	0	0	0	
21	Polls	0	0	0	0	0	(Avg)	0	0	0	0	
22	PostComments	4,985,865	4,960,128	2,086,312	2,870,888	2,928	(Avg)	7,074,729	2,975,748	4,094,805	14,149,458	5,95
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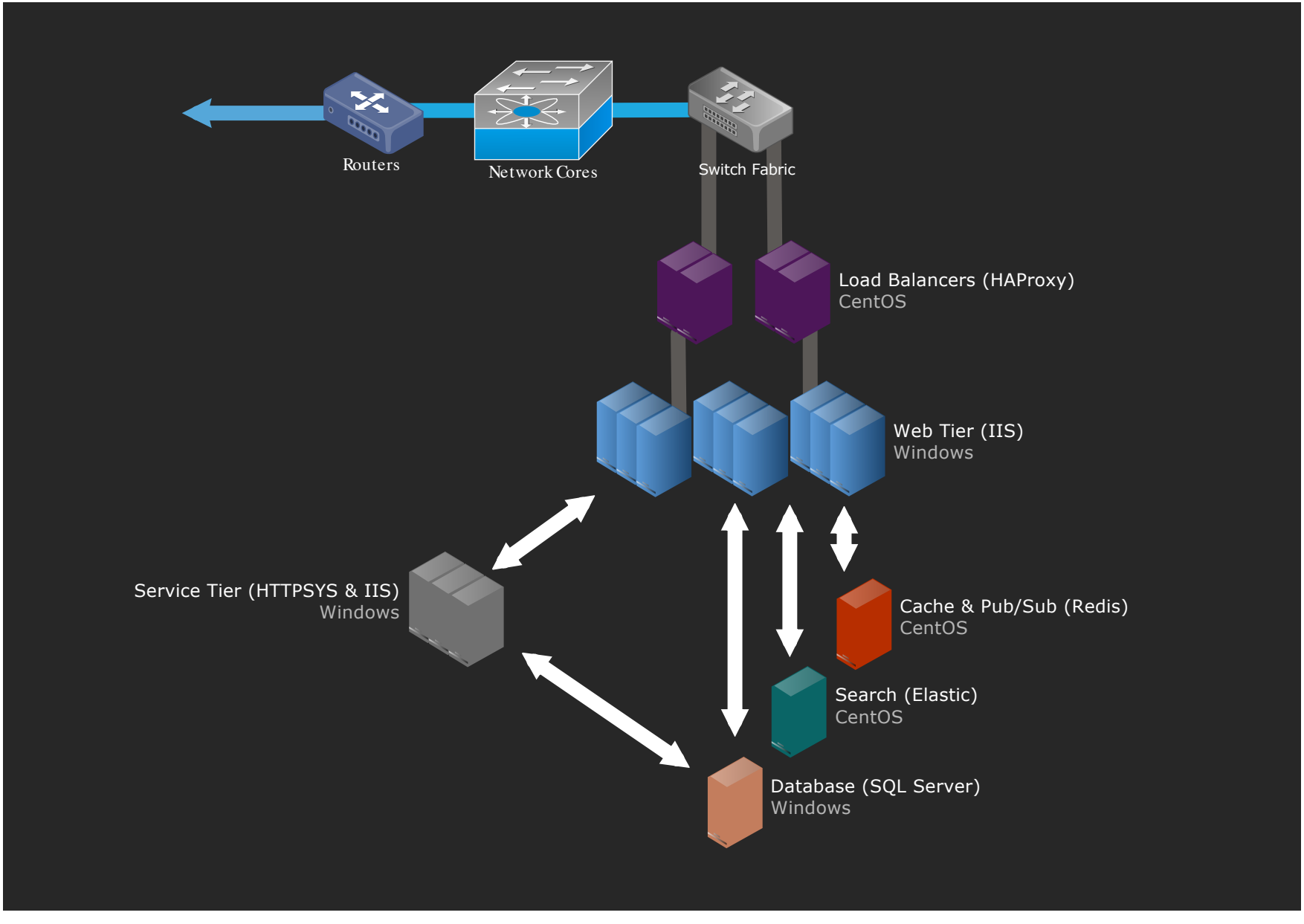
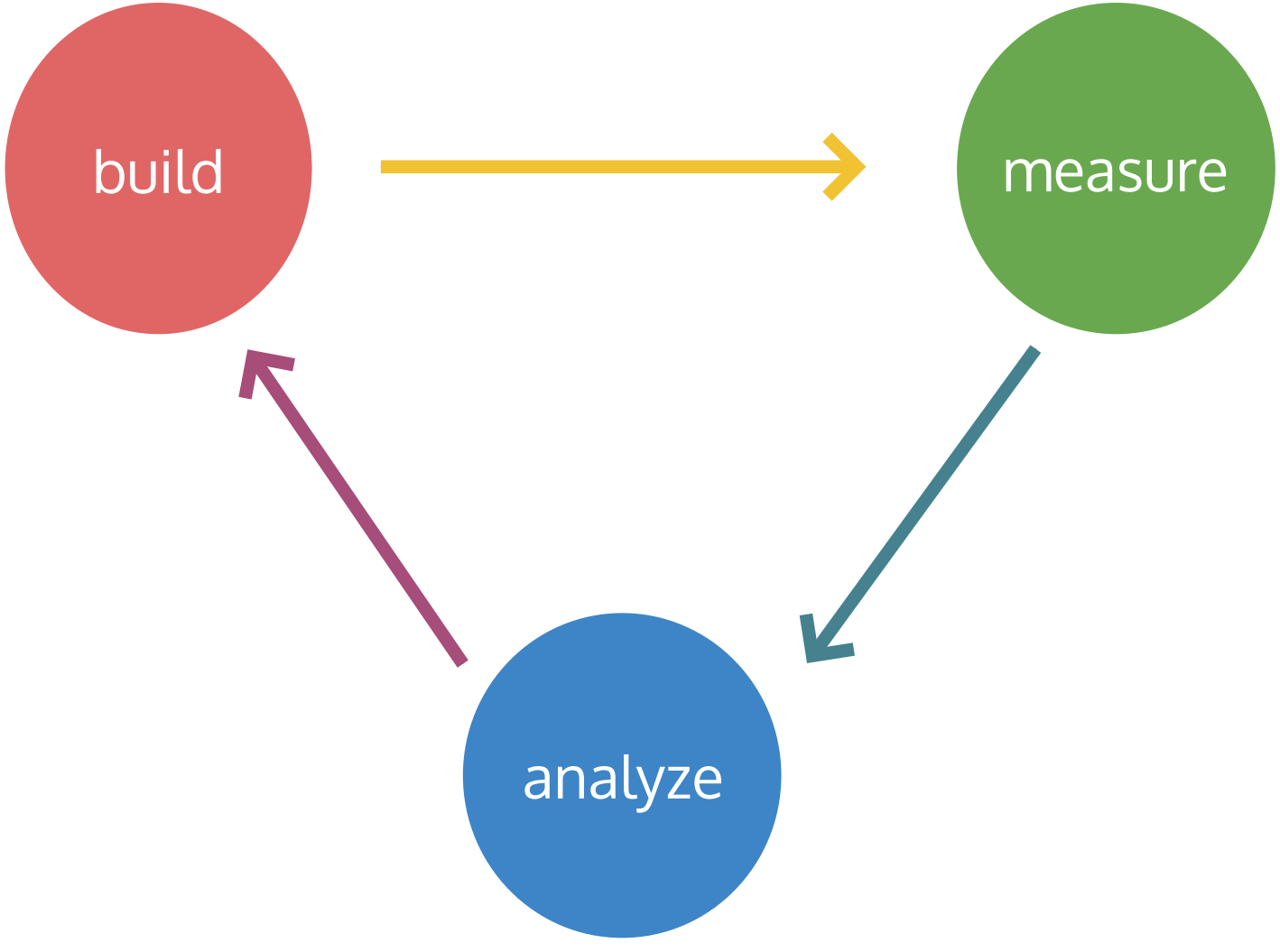
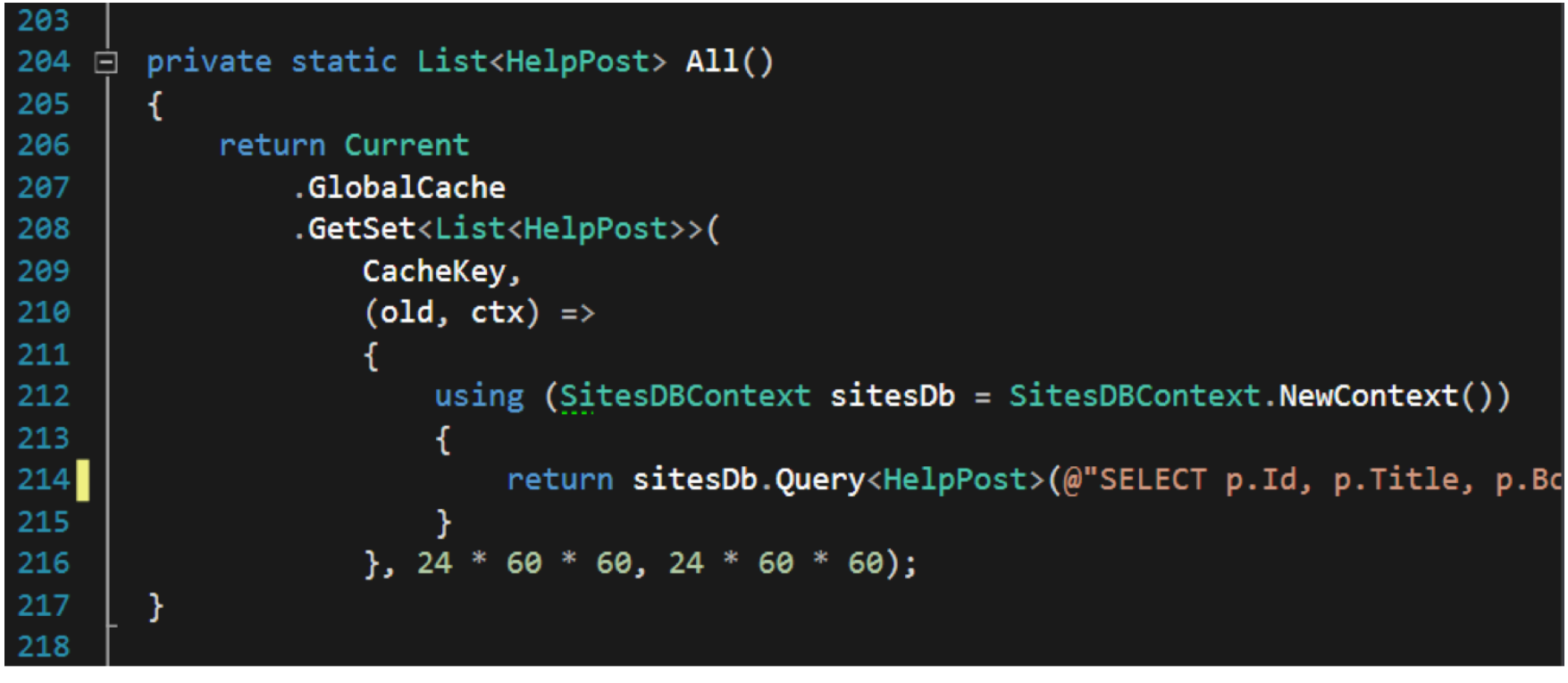
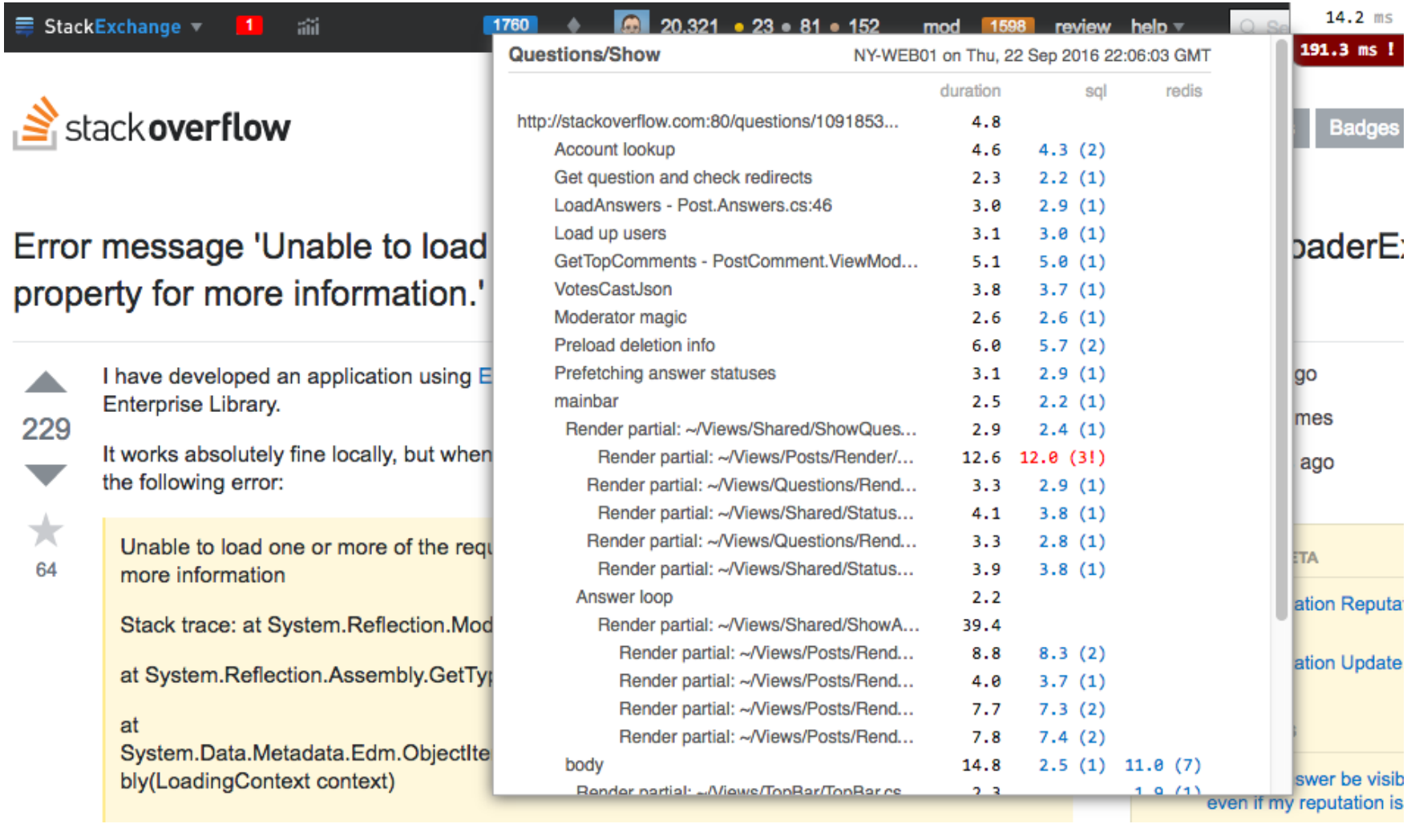
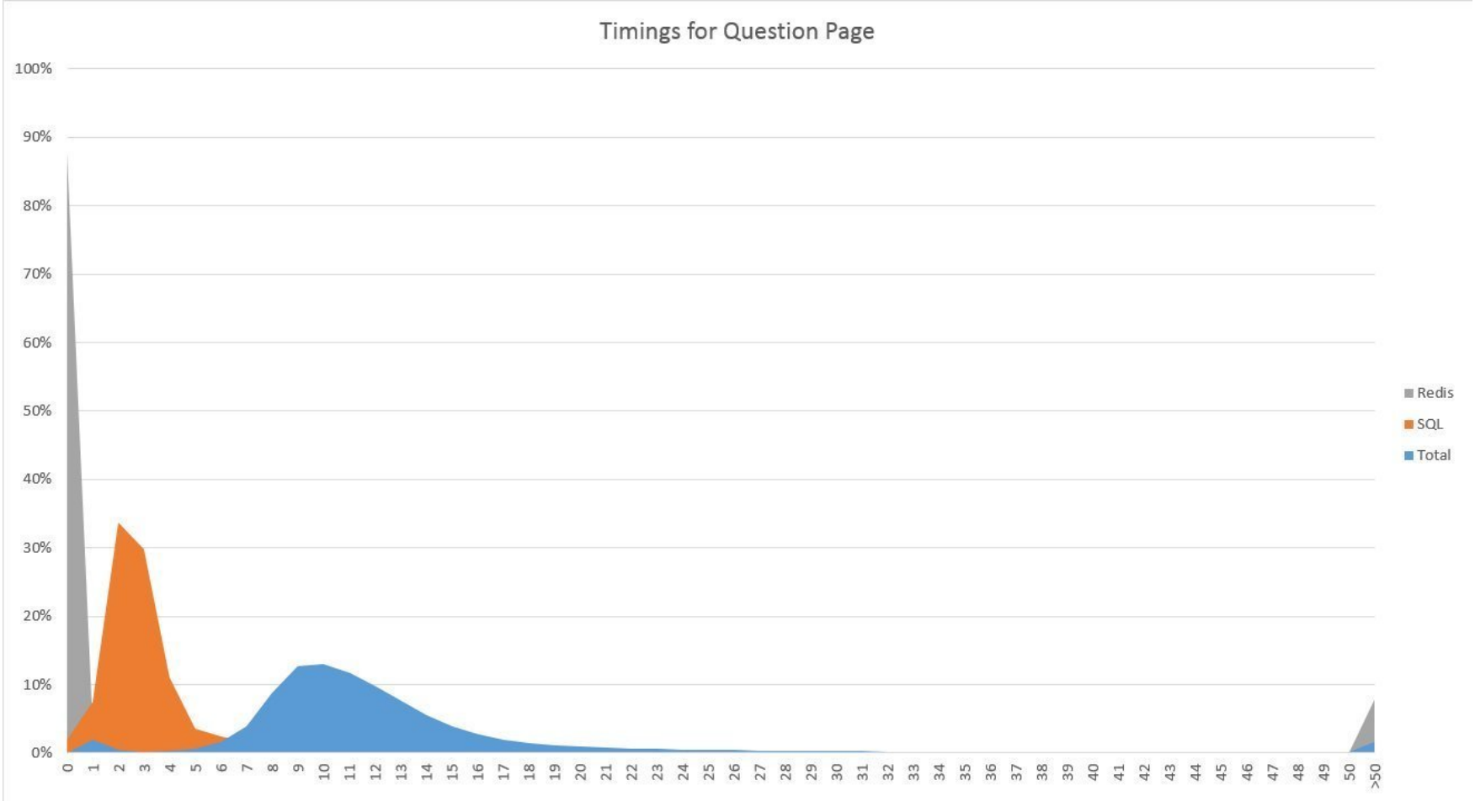
32	PrivilegeTypeNotifications	786,315	43,224	22,640	20,320	264	(Avg)	61,651	32,292	28,983	123,302	6


Routers
Network Cores
Switch Fabric
Load Balancers (HAProxy)
CentOS
Web Tier (IIS)
Windows
Service Tier (HTTPSYS & IIS)
Windows
Cache & Pub/Sub (Redis)
CentOS
Search (Elastic)
CentOS
Database (SQL Server)
Windows

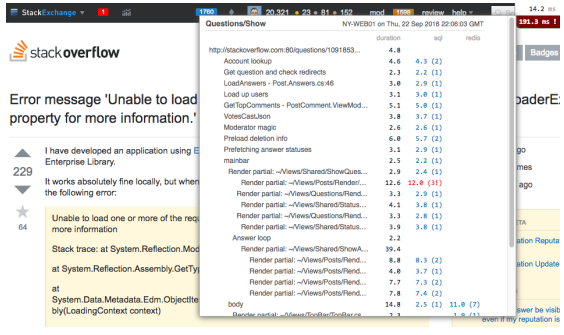

build
measure
analyze

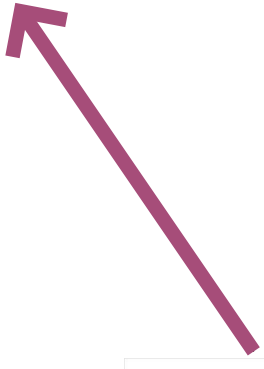


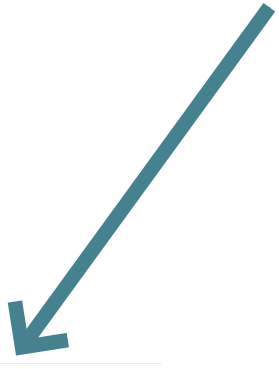

StackExchange
1760
20,321 • 23 • 81 • 152
mod
1598
review
help
14.2 ms
191.3 ms !
stackoverflow
Badges
Error message 'Unable to load
property for more information.'
I have developed an application using E
Enterprise Library.
It works absolutely fine locally, but when
the following error:
229
64
Unable to load one or more of the requ
more information
Stack trace: at System.Reflection.Mod
at System.Reflection.Assembly.GetTyp
at
System.Data.Metadata.Edm.ObjectIte
bly(LoadingContext context)
Questions/Show
NY-WEB01 on Thu, 22 Sep 2016 22:06:03 GMT
duration
sql
redis
http://stackoverflow.com:80/questions/1091853... 4.8
Account lookup 4.6 4.3 (2)
Get question and check redirects 2.3 2.2 (1)
LoadAnswers - Post.Answers.cs:46 3.0 2.9 (1)
Load up users 3.1 3.0 (1)
GetTopComments - PostComment.ViewMod... 5.1 5.0 (1)
VotesCastJson 3.8 3.7 (1)
Moderator magic 2.6 2.6 (1)
Preload deletion info 6.0 5.7 (2)
Prefetching answer statuses 3.1 2.9 (1)
mainbar 2.5 2.2 (1)
Render partial: ~/Views/Shared/ShowQues... 2.9 2.4 (1)
Render partial: ~/Views/Posts/Render/... 12.6 12.0 (3!)
Render partial: ~/Views/Questions/Rend... 3.3 2.9 (1)
Render partial: ~/Views/Shared/Status... 4.1 3.8 (1)
Render partial: ~/Views/Questions/Rend... 3.3 2.8 (1)
Render partial: ~/Views/Shared/Status... 3.9 3.8 (1)
Answer loop 2.2
Render partial: ~/Views/Shared/ShowA... 39.4
Render partial: ~/Views/Posts/Rend... 8.8 8.3 (2)
Render partial: ~/Views/Posts/Rend... 4.0 3.7 (1)
Render partial: ~/Views/Posts/Rend... 7.7 7.3 (2)
Render partial: ~/Views/Posts/Rend... 7.8 7.4 (2)
body 14.8 2.5 (1) 11.0 (7)
go
mes
ago
ation Reputa
ation Update
even if my reputation is

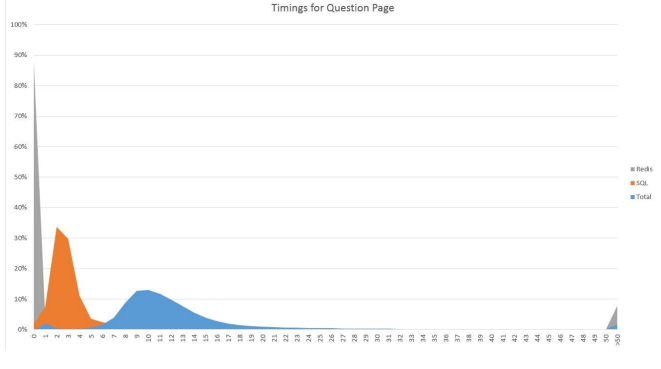

Timings for Question Page
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 >50
Redis
SQL
Total

```
203
204   private static List<HelpPost> All()
205   {
206       return Current
207           .GlobalCache
208           .GetSet<List<HelpPost>>(
209               CacheKey,
210               (old, ctx) =>
211               {
212                   using (SitesDBContext sitesDb = SitesDBContext.NewContext())
213                   {
214                       return sitesDb.Query<HelpPost>(@"SELECT p.Id, p.Title, p.Bo
215                   }
216               }, 24 * 60 * 60, 24 * 60 * 60);
217   }
218
```

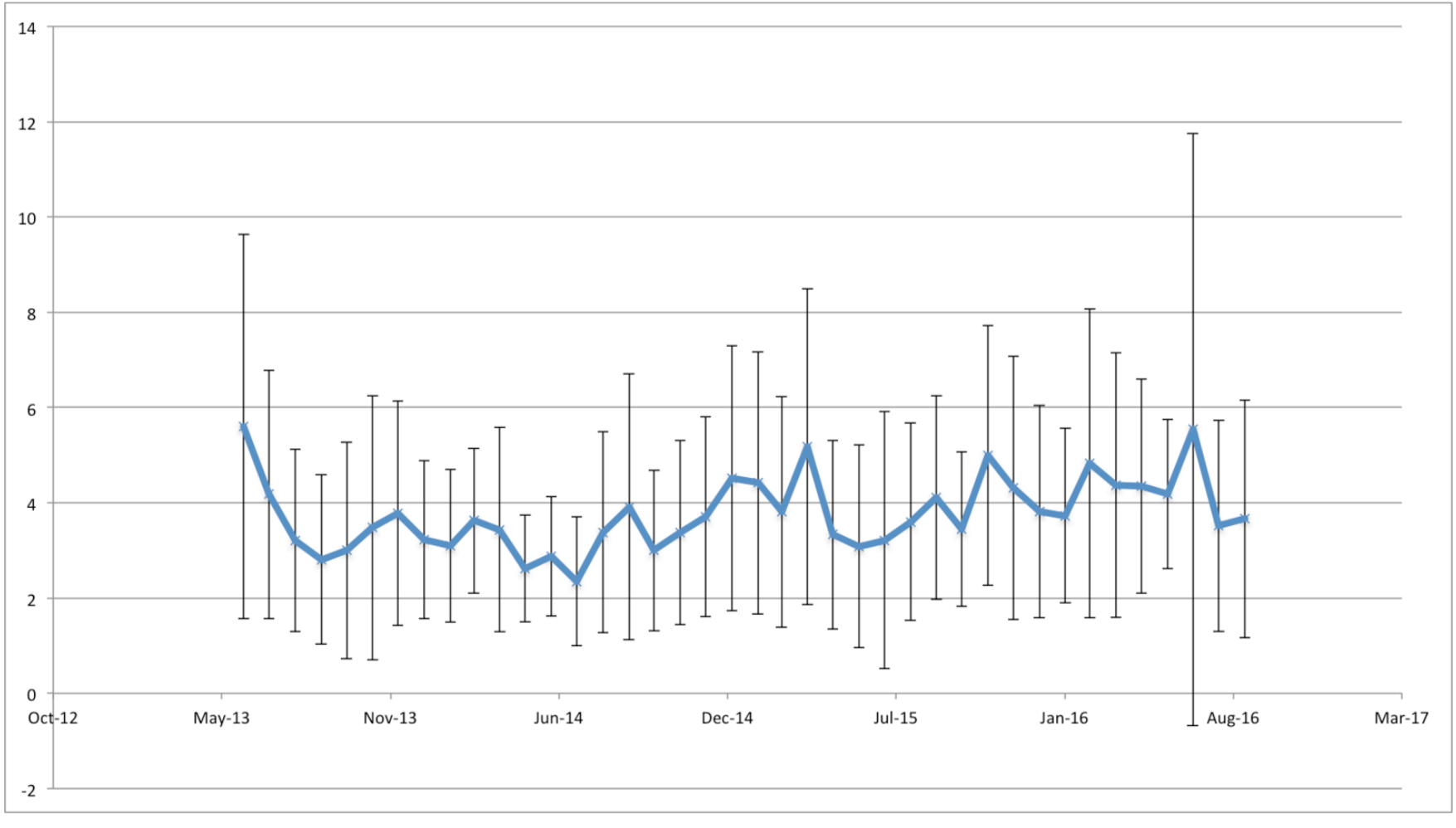








Production Deployments per day



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Anybody can answer

The best answers are voted up and rise to the top

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search

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- What types of questions should I avoid asking?
- What does it mean if a question is "closed" or "on hold"?
- Why are questions no longer being accepted from my account?
- Why and how are some questions deleted?

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- How do I find topics I'm interested in?
- How do I search?
- What is "meta"? How does it work?
- How do I format my posts using Markdown or HTML?

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- What is reputation? How do I earn (and lose) it?
- Who are the site moderators, and what is their role here?
- Why is voting important?

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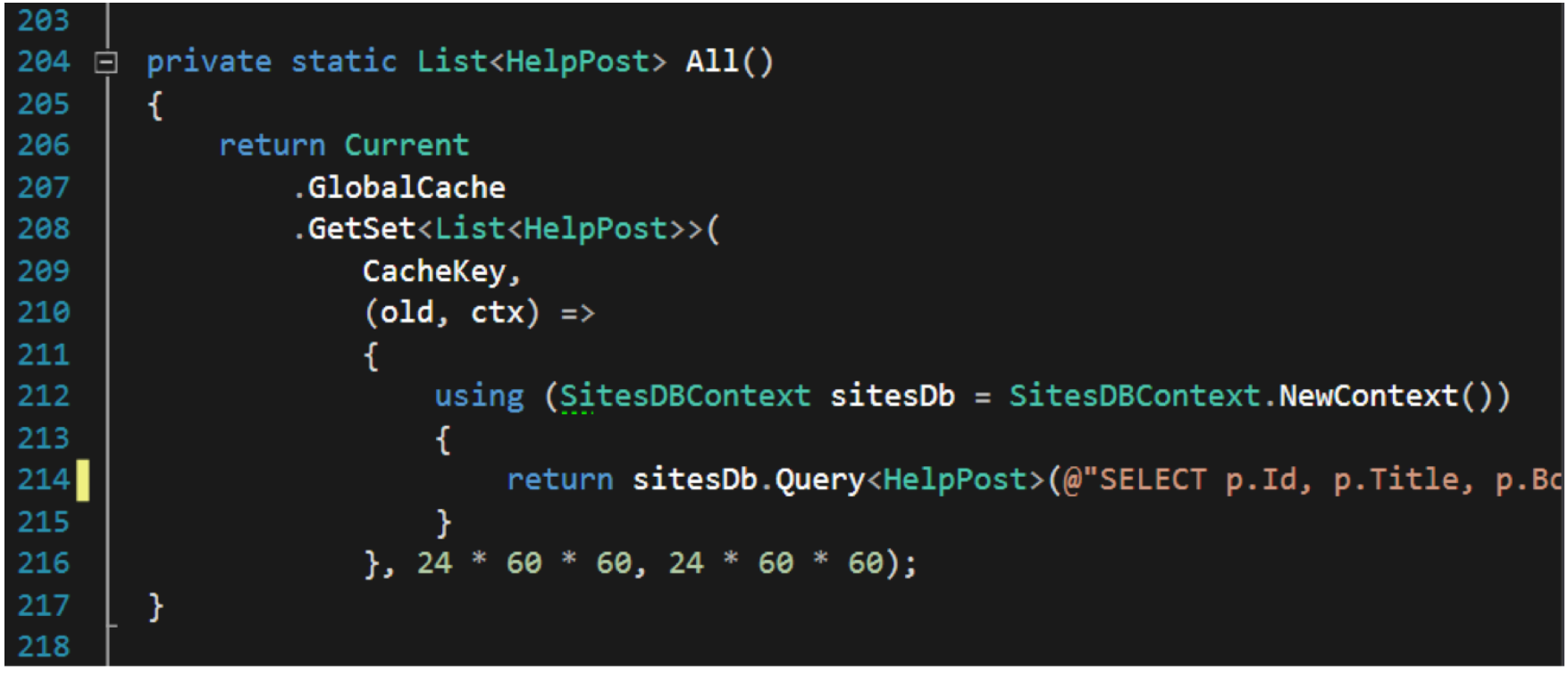


have earned at least 10 reputation on this site.

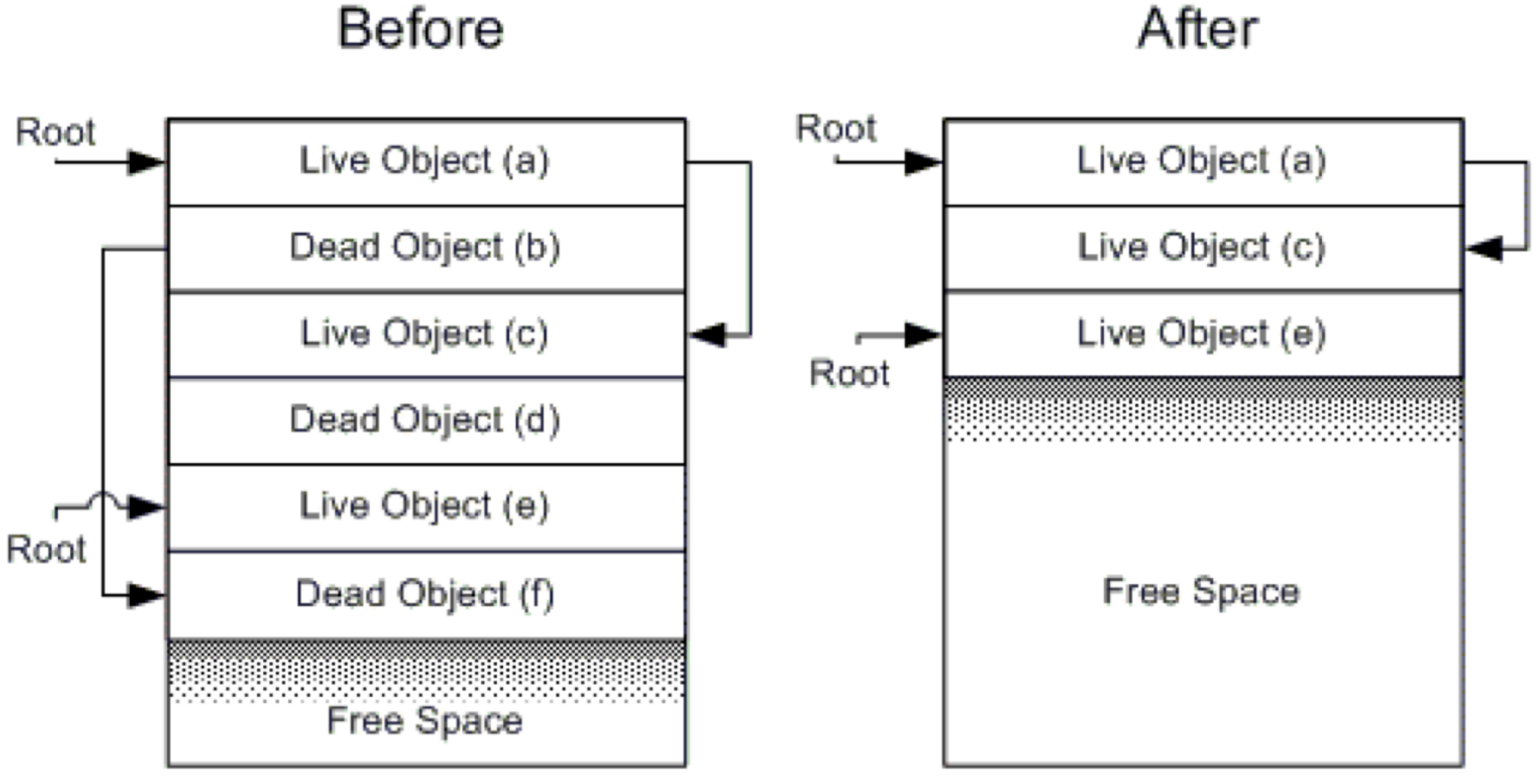
62 Answers

active oldest votes

4431

You can't parse [X]HTML with regex. Because HTML can't be parsed by regex. Regex is not a tool that can be used to correctly parse HTML. As I have answered in HTML-and-regex questions here so many times before, the use of regex will not allow you to consume HTML. Regular expressions are a tool that is insufficiently sophisticated to understand the constructs employed by HTML. HTML is not a regular language and hence cannot be parsed by regular expressions. Regex queries are not equipped to break down HTML into its meaningful parts. so many times but it is not getting to me. Even enhanced irregular regular expressions as used by Perl are not up to the task of parsing HTML. You will never make me crack. HTML is a language of sufficient complexity that it cannot be parsed by regular expressions. Even Jon Skeet cannot parse HTML using regular expressions. Every time you attempt to parse HTML with regular expressions, the unholy child weeps the blood of virgins, and Russian hackers pwn your webapp. Parsing HTML with regex summons tainted souls into the realm of the living. HTML and regex go together like love, marriage, and ritual infanticide. The cannot hold it is too late. The force of regex and HTML together in the same conceptual space will destroy your mind like so much watery putty. If you parse HTML with regex you are giving in to Them and their blasphemous ways which doom us all to inhuman toil for the One whose Name cannot be expressed in the Basic Multilingual Plane, he comes. HTML-plus-regexp will liquify the nerves of the sentient whilst you observe, your psyche withering in the onslaught of horror. Regex-based HTML parsers are the cancer that is killing StackOverflow *it is too late it is too late we cannot be saved* the trangession of a child ensures regex will consume all living tissue (except for HTML which it cannot, as previously prophesied) *dear lord help us how can anyone survive this scourge* using regex to parse HTML has doomed humanity to an eternity of dread torture and security holes *using regex* as a tool to process HTML establishes a breach *between this world* and the dread realm of corrupt entities (like SGML entities, but *more corrupt) a mere glimpse* of the world of reg**ex parsers for HTML will ins**tantly transport a *programmer's consciousness i*nto a world of ceaseless screaming, he comes~~, the pestilent sli~~thy regex-infection will **devour your HT**ML parser, application and existence for all time like Visual Basic only worse *he comes he comes do not fight h***e com*es, h*is unholy radiance destroying all enlightenment, HTML tags **leaking from your eyes like liq***uid pain*, the song of regular expr~~ession parsing~~ will ext*inguish the voices of mor***tal man from the sp***here I can see it can you see it it is beautiful* the `final snuf` fing *of the lie***s of Man ALL IS LOST ALL IS** LOST the *pony he comes* he come~~s he comes~~ **t***he* **ich**or permeates all MY FACE *MY FACE oh god n***o NO NO**OO NO stop *the an*~~*~~es `are` **not rea**l **ZALGO IS TONY THE PONY HE COMES**

```
346
347     @Html.Partial("~/Views/Shared/PageTabs.cshtml", new PageTabs
348     {
349         Tabs = Current.LocalCache.GetSet<List<TabItem>>("question-show-tabs", (_1,_2) => new List<TabItem>
350         {
351             new TabItem
352             {
353                 Value = ShowViewData.Tab.Active,
354                 Title = _s("active"),
355                 Description = _s("Answers with the latest activity first")
356             },
357             new TabItem
358             {
359                 Value = ShowViewData.Tab.Oldest,
360                 Title = _s("oldest"),
361                 Description = _s("Answers in the order they were provided")
362             },
363             new TabItem
364             {
365                 Value = ShowViewData.Tab.Votes,
366                 Title = _s("votes"),
367                 Description = _s("Answers with the highest score first")
368             },
369         }, 24 * 60 * 60, 24 * 60 * 60),
370         UrlFormat = Question.UrlRelative + "?answertab={0}#tab-top",
371         CurrentSelection = Model.CurrentTab
372     })
373
```


Before
Root
Live Object (a)
Dead Object (b)
Live Object (c)
Dead Object (d)
Live Object (e)
Root
Dead Object (f)
Free Space
After
Root
Live Object (a)
Live Object (c)
Live Object (e)
Root
Free Space

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370         UrlFormat = Question.UrlRelative + "?answertab={0}#tab-top",
371         CurrentSelection = Model.CurrentTab
372     })
373
```

```
<div class="page-description" style="width: 100%">
    <p>
        @_s(@"Privileges control what you can do on $ShortName$. Gain more privileges by increasing your reputation
              (points you receive from your fellow users for posting helpful questions and answers).", Current.Site)
    </p>
</div>
```

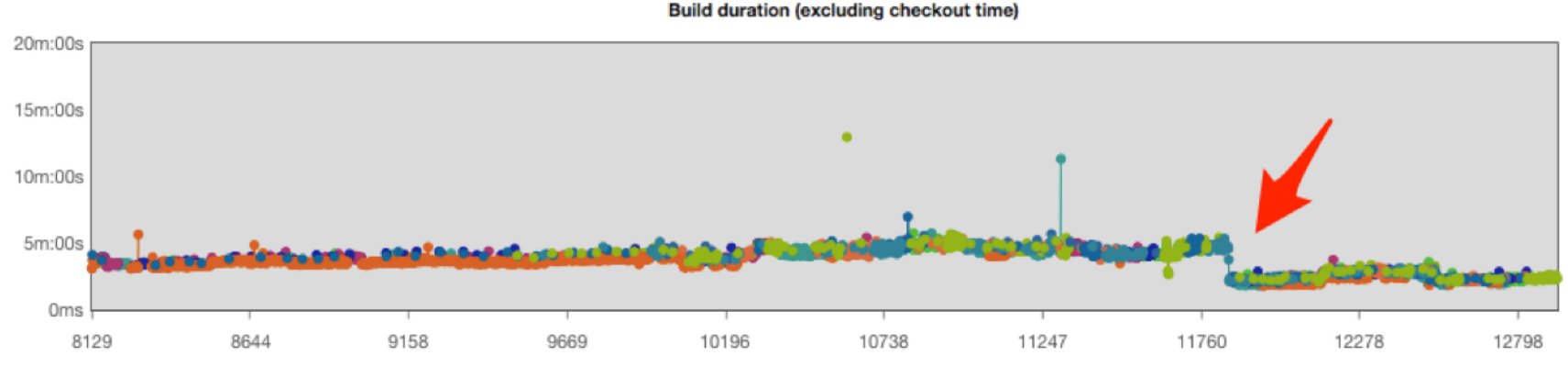
```
this.WriteLiteral("</a></h1>\r\n    </div>\r\n\r\n\r\n    <div");
this.WriteLiteral(" class=\"page-description\"");
this.WriteLiteral(" style=\"width: 100%\"");
this.WriteLiteral(">\r\n        <p>\r\n");
this.WriteLiteral("            ");
HttpRequestBase request = this.Request;
WebViewPage page = this;
this.Write(Generated._s_d1bdXVUZhZ8N04cwjjZ7Ewóó_wr(Current.Site.ShortName, request, page));
this.WriteLiteral("\r\n        </p>\r\n    </div>\r\n\r\n\r\n    <div");
this.WriteLiteral(" class=\"subheader\"");
this.WriteLiteral(">\r\n");
```

```
public static string _s_d1bdXVUZhZ8N04cwjjZ7Ewóó_wr(object ShortName, HttpRequestBase req_d1bdXVUZhZ8N04cwjjZ7Ewóó = null, WebViewPage view_d1bdXVUZhZ8N04cwjjZ7Ewóó = null)
{
    CultureInfo currentCulture = _cultureProvider.GetCurrentCulture(req_d1bdXVUZhZ8N04cwjjZ7Ewóó, view_d1bdXVUZhZ8N04cwjjZ7Ewóó).GetCurrentCulture();
    switch (currentCulture.LCID)
    {
        case 0x19:
            view_d1bdXVUZhZ8N04cwjjZ7Ewóó.Write("Привилегии определяют набор доступных действий на сайте ");
            view_d1bdXVUZhZ8N04cwjjZ7Ewóó.Write(ShortName);
            view_d1bdXVUZhZ8N04cwjjZ7Ewóó.Write(". Повышая свою репутацию, вы открываете новые привелегии (репутация — это баллы, которые вы получаете от других пользователей за
            return string.Empty;

        case 0x416:
            view_d1bdXVUZhZ8N04cwjjZ7Ewóó.Write("Os privil\x00e9gios determinam o que voc\x00ea pode fazer no ");
            view_d1bdXVUZhZ8N04cwjjZ7Ewóó.Write(ShortName);
            view_d1bdXVUZhZ8N04cwjjZ7Ewóó.Write(". Quanto maior sua reputa\x00e7\x00e3o (os pontos que voc\x00ea recebe dos outros usu\x00e1rios por bons posts), mais privil\x00e9gios voc\x0(
            return string.Empty;

        case 0x450:
            view_d1bdXVUZhZ8N04cwjjZ7Ewóó.Write("Ṕṙ\x00efṽ\x00efĺ\x00ebǵ\x00ebś ć\x00f6ńţṙ\x00f6Ĺ ẅḧ\x00e5ţ \x00ff\x00f6ů ć\x00e5ń ḋ\x00f6 \x00f6ń ");
            view_d1bdXVUZhZ8N04cwjjZ7Ewóó.Write(ShortName);
            view_d1bdXVUZhZ8N04cwjjZ7Ewóó.Write(". Ǵ\x00e5\x00efń ḿ\x00f6ṙ\x00eb ṕṙ\x00efṽ\x00efĺ\x00ebǵ\x00ebś ḅ\x00ff \x00efńćṙ\x00eb\x00e5ś\x00efńǵ \x00ff\x00f6ůŕ ṙ\x00ebṕůţ\x00e5ţ\x00e
            return string.Empty;

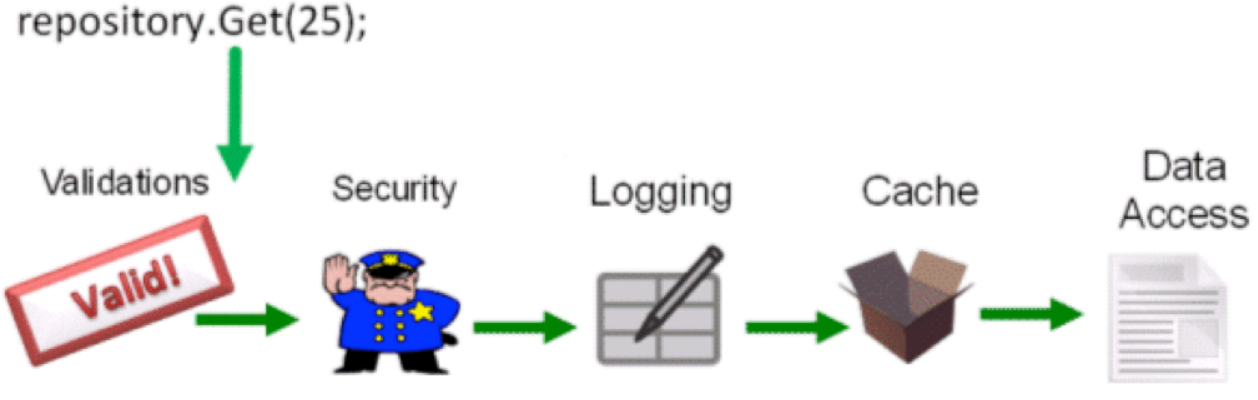
        case 9:
            view_d1bdXVUZhZ8N04cwjjZ7Ewóó.Write("Privileges control what you can do on ");
            view_d1bdXVUZhZ8N04cwjjZ7Ewóó.Write(ShortName);
            view_d1bdXVUZhZ8N04cwjjZ7Ewóó.Write(". Gain more privileges by increasing your reputation (points you receive from your fellow users for posting helpful questions and answers).");
            return string.Empty;
```


Build duration (excluding checkout time)
20m:00s
15m:00s
10m:00s
5m:00s
0ms
8129
8644
9158
9669
10196
10738
11247
11760
12278
12798

Dependency Injection

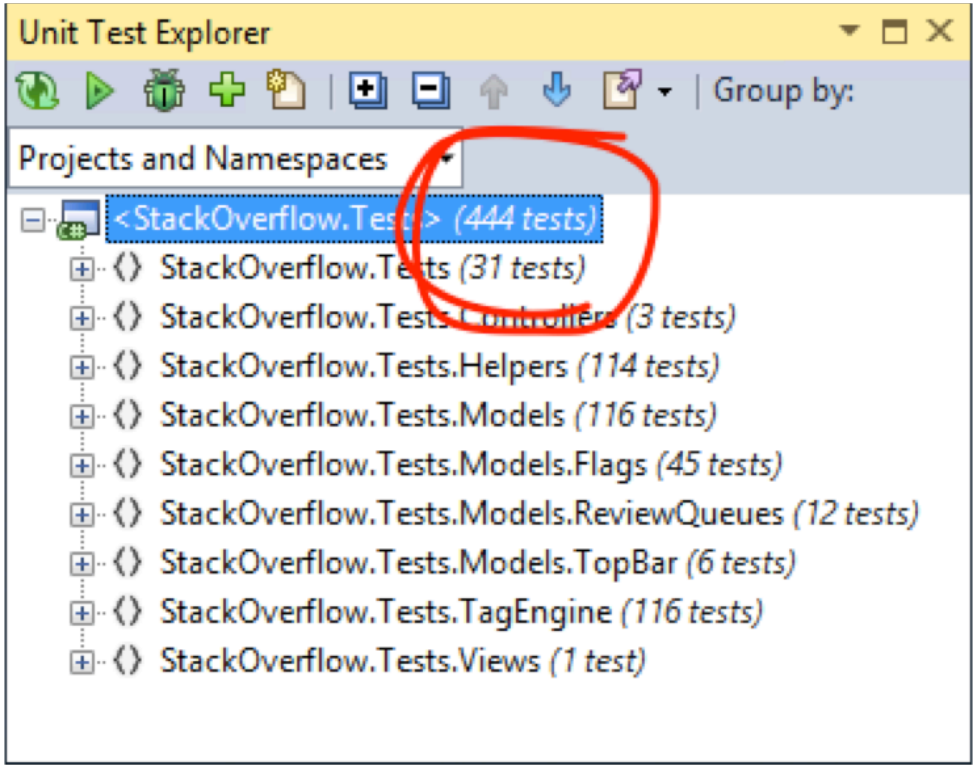
```
IRepository<Order> repository = container.Resolve<IRepository<Order>>();

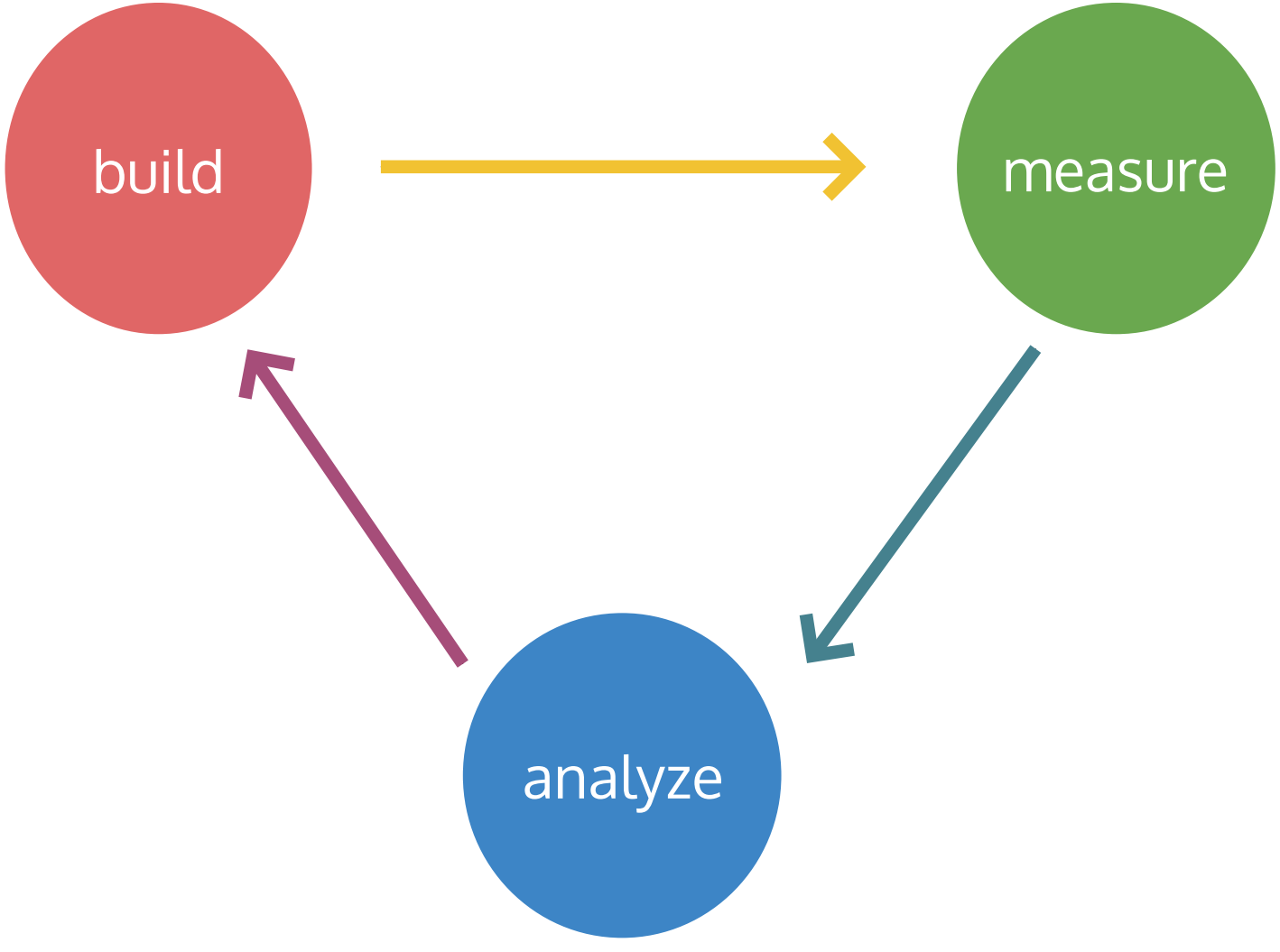
Order order = repository.Get(25);
```



```
public IRepository<T> Resolve<T>()
{
    var data = new NHibernateRepository<T>();
    var cache = new CachingRepository<T>(data);
    var log = new LoggingRepository<T>(cache);
    var sec = new SecurityRepository<T>(log);
    var valid = new ValidatingRepository<T>(sec);

    return valid;
}
```


Unit Test Explorer
Group by:
Projects and Namespaces
<StackOverflow.Tests> (444 tests)
StackOverflow.Tests (31 tests)
StackOverflow.Tests.Controllers (3 tests)
StackOverflow.Tests.Helpers (114 tests)
StackOverflow.Tests.Models (116 tests)
StackOverflow.Tests.Models.Flags (45 tests)
StackOverflow.Tests.Models.ReviewQueues (12 tests)
StackOverflow.Tests.Models.TopBar (6 tests)
StackOverflow.Tests.TagEngine (116 tests)
StackOverflow.Tests.Views (1 test)


build
measure
analyze

I DON'T ALWAYS TEST MY CODE
BUT WHEN I DO I DO IT IN PRODUCTION
memegenerator.net

Ctrl+Click and Shift+Click do not open new tabs/windows in search

30

1

When I perform a search, I often want to open several results in new tabs using Ctrl+Click. Until recently, I don't remember having any problem doing this.

Today, I cannot open search results in new tabs using modifier keys. For example, when Ctrl+Click-ing on any link in http://stackoverflow.com/search?q=foobar, the operation is treated as a normal click. I can still use "Open in new tab" in the context menu, but that's quite a bit slower.

I can reproduce this behavior in Firefox and Chrome for Windows.

This behavior does not appear on a few other SE sites I tested.

bug status-completed search

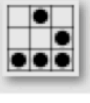
mod | share | edit | close | delete | flag

edited 21 hours ago

Haney ♦

8,413 ●4 ●14 ●32

asked yesterday



apsillers

30.4k ●10 ●20

13

The problem seems to be here:

```
$(".js-search-results").on("click", "div.result-link a", function (ev) {
    ev.preventDefault();
    window.location.href = $(this).data("searchsession");
    return false;
});
```

this finds the clicks on search results, prevents the default handler, and changes the current webpage.

mod | share | edit | delete | flag

answered yesterday

Yakk

37.9k ●1 ●6 ●16

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mod | share | edit | delete | flag

answered yesterday
Yakk
37.9k •1 •6 •16

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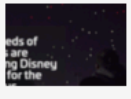


300 drones take to the skies above Disney World for the holidays
6 days ago

Google's redesigned Google Sites goes live
2 days ago

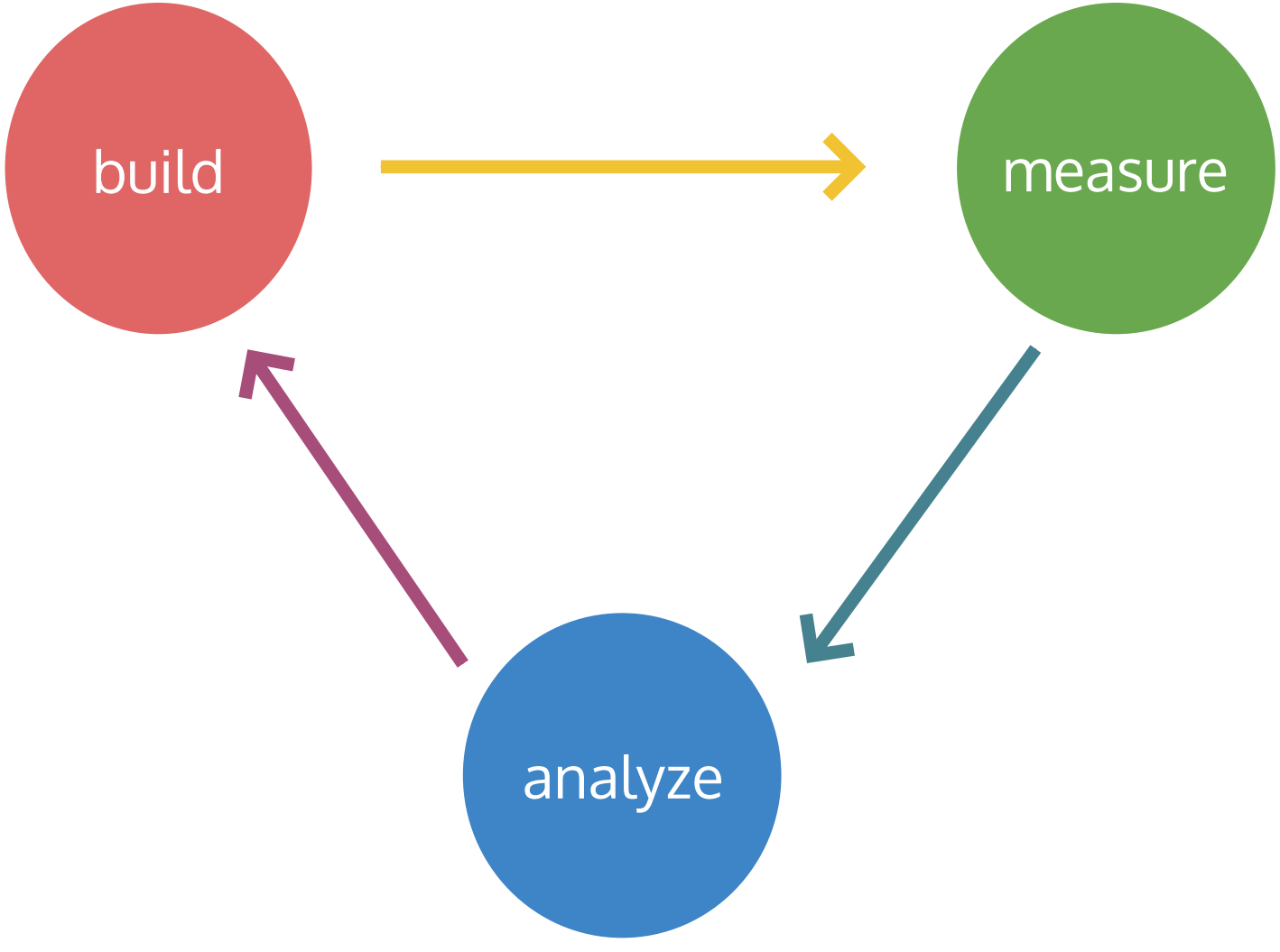
Stack Overflow Goes Down, Programmers Around The World Panic (It's Back Up Now)

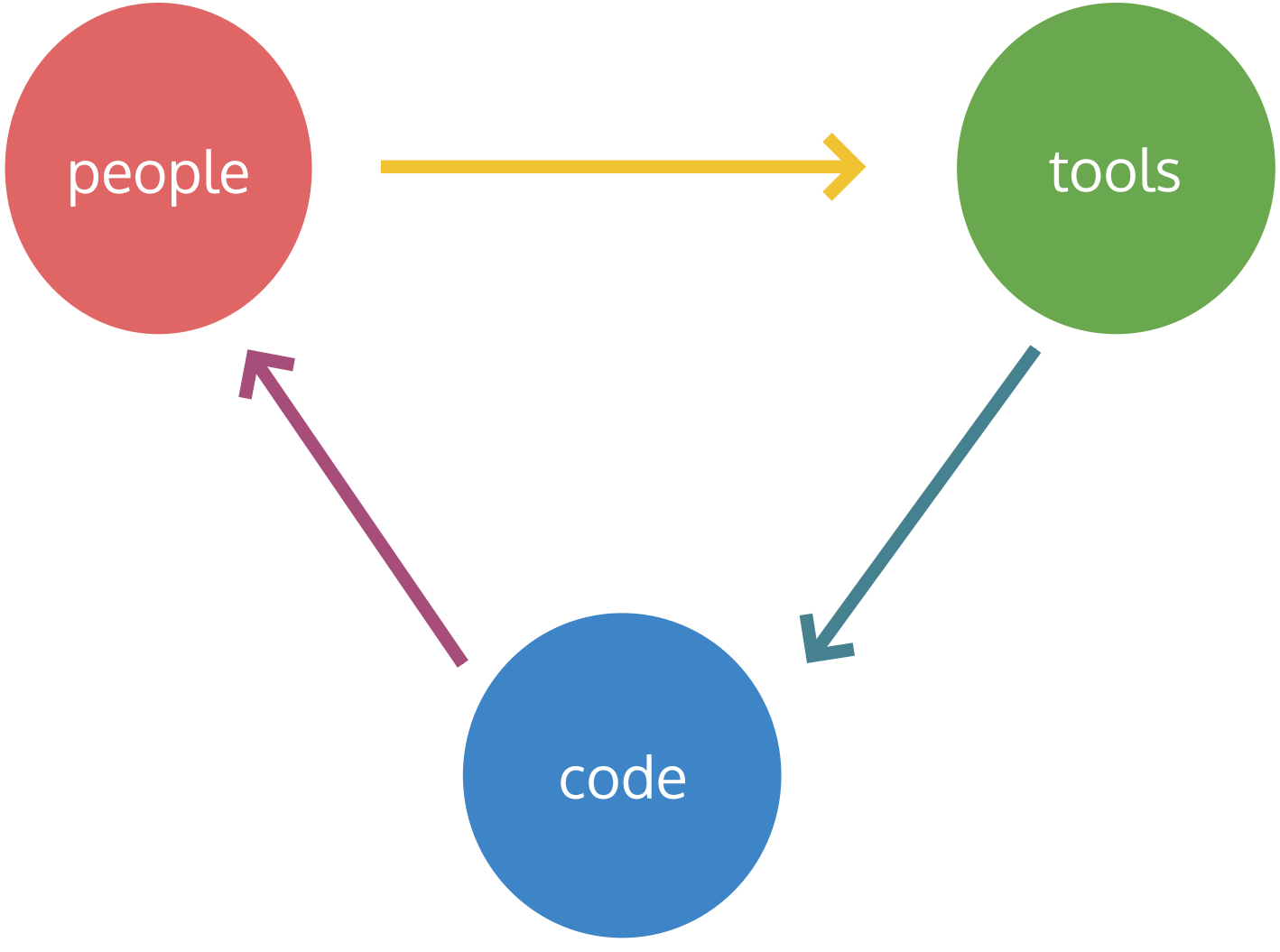
Posted Feb 16, 2014 by ***Colleen Taylor*** *(@loyalelectron), Contributor*

Next Story

Stack Overflow, the coding-focused Q&A site that's proven to be an essential tool for professional and amateur programmers alike, had an approximately hour-long outage Sunday morning that affected a number of users.

According to Stack Overflow's parent company Stack Exchange, the cause was a DDoS attack against its network provider. The issue has been "partially mitigated" and the site is back up

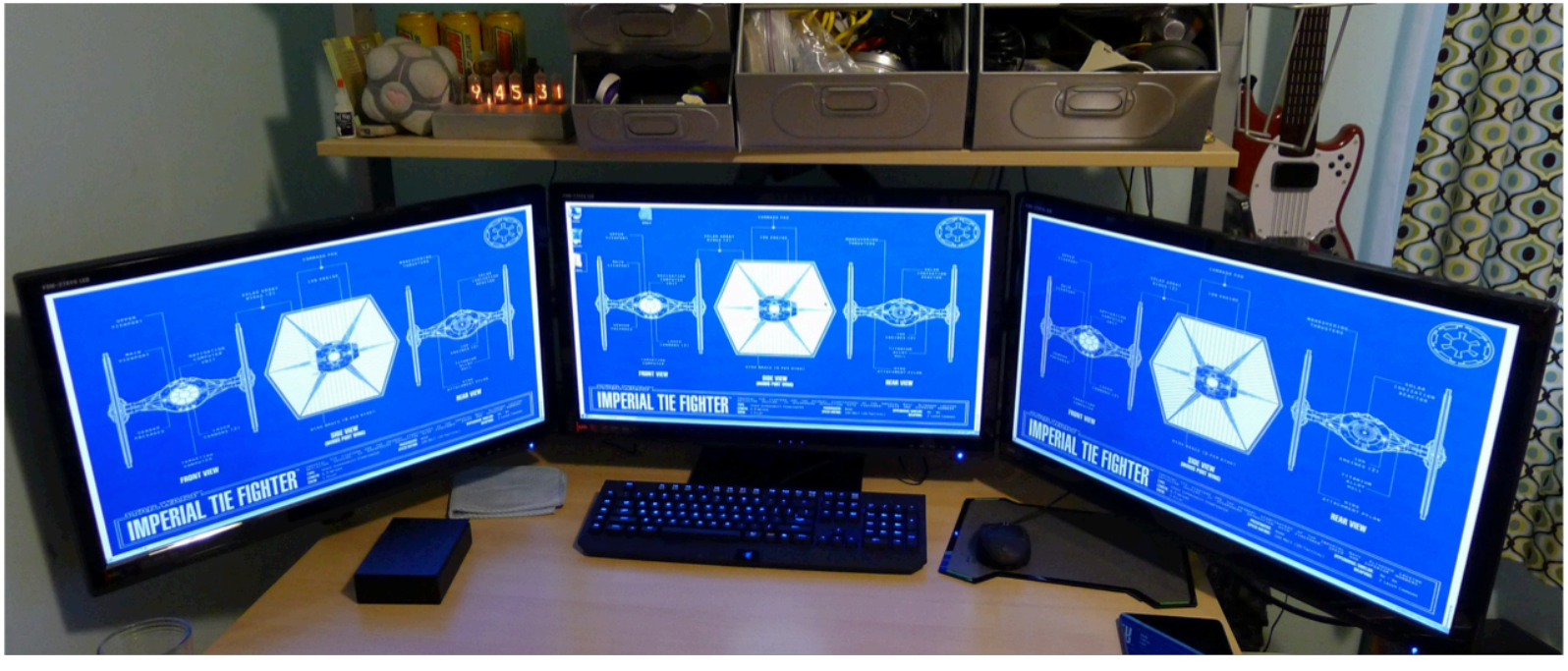

build
measure
analyze

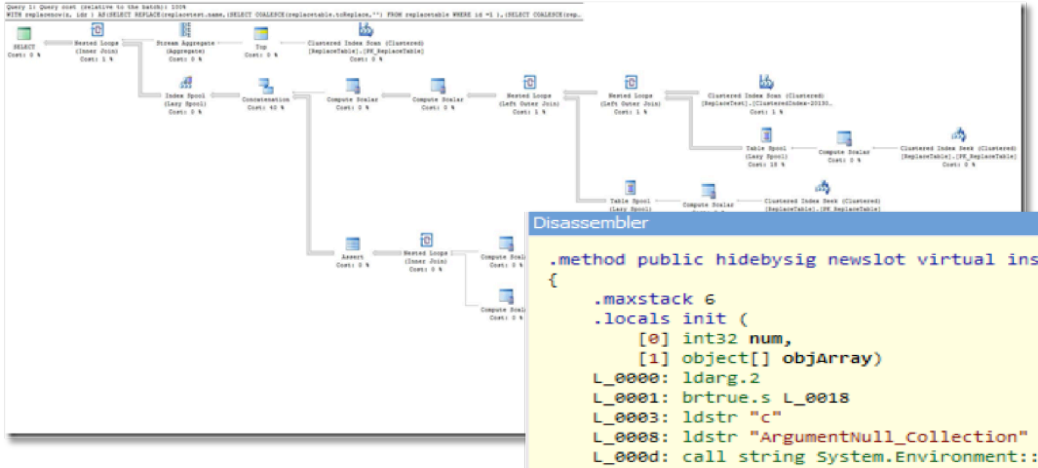

people
tools
code

ANGELINA-PLACE.COM/PICTURE - JOLIE'S PHOTO GALLERY * ANGELINA-PLACE.COM/PICTURE - JOLIE'S PHOTO GALLERY * ANGELINA-PLACE.COM/PICTURE - JOLIE'S PHOTO GALLERY * ANGELINA-PLACE.COM/PICTURE - JOLIE'S PHOTO GALLERY

HIRE HACKERS
LET THEM CODE

BOSS MODE TOOLS



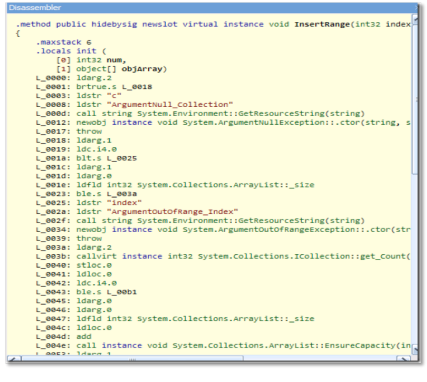


Disassembler

```
.method public hidebysig newslot virtual instance void InsertRange(int32 index
{
    .maxstack 6
    .locals init (
        [0] int32 num,
        [1] object[] objArray)
    L_0000: ldarg.2
    L_0001: brtrue.s L_0018
    L_0003: ldstr "c"
    L_0008: ldstr "ArgumentNull_Collection"
    L_000d: call string System.Environment::GetResourceString(string)
    L_0012: newobj instance void System.ArgumentNullException::.ctor(string, s
    L_0017: throw
    L_0018: ldarg.1
    L_0019: ldc.i4.0
    L_001a: blt.s L_0025
    L_001c: ldarg.1
    L_001d: ldarg.0
    L_001e: ldfld int32 System.Collections.ArrayList::_size
    L_0023: ble.s L_003a
    L_0025: ldstr "index"
    L_002a: ldstr "ArgumentOutOfRange_Index"
    L_002f: call string System.Environment::GetResourceString(string)
    L_0034: newobj instance void System.ArgumentOutOfRangeException::.ctor(str
    L_0039: throw
    L_003a: ldarg.2
    L_003b: callvirt instance int32 System.Collections.ICollection::get_Count(
    L_0040: stloc.0
    L_0041: ldloc.0
    L_0042: ldc.i4.0
    L_004d: add
    L_004e: call instance void System.Collections.ArrayList::EnsureCapacity(in
```

BOSS MODE CODE

IMPERIAL TIE FIGHTER


Disassembler
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L_001a: blt.s L_0025
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L_001d: ldarg.0
L_001e: ldfld int32 System.Collections.ArrayList::_size
L_0023: ble.s L_002a
L_0025: ldstr "index"
L_002a: ldstr "ArgumentOutOfRange_Index"
L_002f: call string System.Environment::GetResourceString(string)
L_0034: newobj instance void System.ArgumentOutOfRangeException::.ctor(str
L_0039: throw
L_003a: ldarg.2
L_003b: callvirt instance int32 System.Collections.ICollection::get_Count(
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L_0041: ldloc.0
L_0042: ldc.i4.0
L_0043: ble.s L_00b1
L_0045: ldarg.0
L_0046: ldarg.0
L_0047: ldfld int32 System.Collections.ArrayList::_size
L_004c: ldloc.0
L_004d: add
L_004e: call instance void System.Collections.ArrayList::EnsureCapacity(in

Conclusion

- Performance is a feature, not a luxury
- Performance is optimized in cycles
- The results are very specific to your case…
- …but also extremely high-value
- Garbage collection is a pain
- Hire hackers…
- *[insert plug about Stack Overflow Jobs]*
- …and buy them those 3 monitors already!

Not a Robot

```
perl -wlne
'BEGIN{$b=rand$=}$a=qw/Tolzhk_kypam_yr_qryaimtcpdjmu_bmr_amk_enq_ghqhmfCnvm/[($_<=>int$b)+1];
$a=~y/a-zA-Z/b-zaB-ZA/;
print $a'
```