

Welcome

Rearchitect your code
towards `async/await`



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Goals

target

CPU-bound vs IO-bound

Threads and Tasks

Async best-practices

Why async is the future

Premise



Terminology

Why

WrapUp

The die
is

cast

javascript

ES2015

\$ npm install babel-plugin-syntax-async-functions
\$ npm install babel-plugin-transform-async-to-generator

```
async function chainAnimationsPromise(elem, animations)
{
  let ret = null;
  try {
    for(const anim of animations) {
      ret = await anim(elem);
    }
  } catch(e) { /* ignore and keep going */ }
  return ret;
}
```

dart

release 1.9

```
runUsingAsyncAwait() async {
  //...
  var entrypoint = await findEntrypoint();
  var exitCode = await
    runExecutable(entrypoint, args);
  await flushThenExit(exitCode);
}
```

python

release 3.5

```
import asyncio
```

```
async def http_get(domain):
    reader, writer =
        await asyncio.open_connection(domain, 80)
```

```
async for line in reader:
    print('>>>', line)
```

httpClient

```
using (var client = new HttpClient()) {  
    var response = await  
        client.GetAsync("api/products/1");  
    if (response.IsSuccessStatusCode)  
    {  
        var product = await  
            response.Content.ReadAsAsync<Product>();  
    }  
}
```


Azure SDK

```
var queryable =  
client.CreateDocumentQuery<Entity>(...)  
    .AsDocumentQuery();
```

```
while (queryable.HasMoreResults)  
{  
    foreach (var e in await  
queryable.ExecuteNextAsync<Entity>())  
    {  
        // Iterate through entities  
    }  
}
```

async
event-driven



Task

uniform



Task

IO-bound



Task

CPU-bound



concurrent
concurrent
concurrent concurrent
concurrent
interleaved



parallel
parallel
simultaneous



Continuation function



await cleanLaundry;

await dryLaundry;

Recap

best-practices

Use `async Task` instead of `async void`

Async all the way, don't mix blocking and asynchronous code

Async / await ●
is viral

but

It kicks your
servers

butt

NServiceBus

Azure Service Bus

26 times

Azure Storage Queues

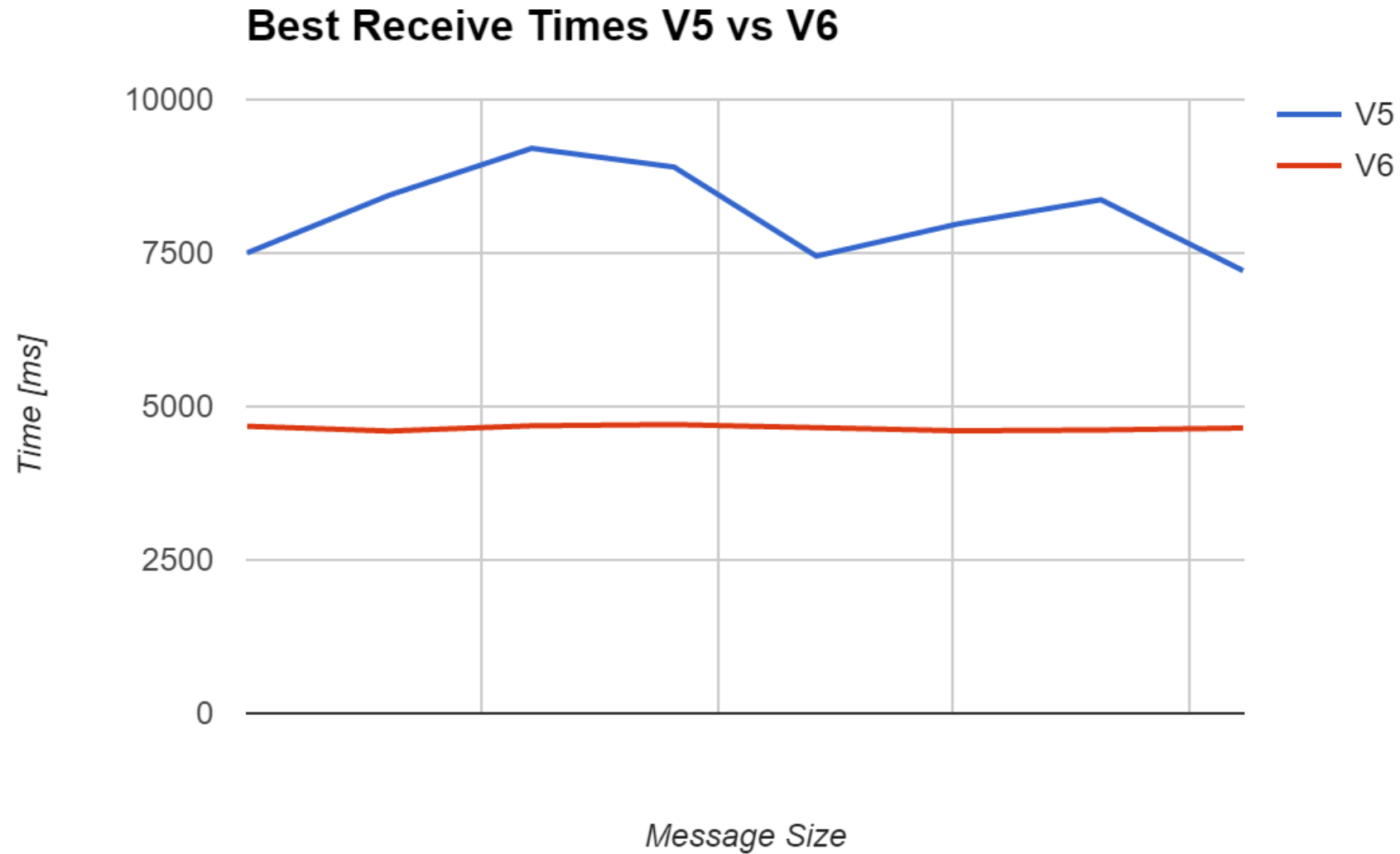
6 times

MSMQ

3 times

more message throughput

NServiceBus.SqlServer





Identification

Discover

Obstacle

Bring it
together

Task.Run
Task.Factory.StartNew
Parallel.For
Parallel.ForEach

Worker
ThreadPool

IO
ThreadPool

await iobound
iobound.FireForget()





Terminology

Why

WrapUp

Recap

reminder

Use `Task.Run`, `Factory.StartNew` for CPU-bound work

Use `Task` directly for IO-bound work

Use `async Task` instead of `async void`

Recap

reminder

Libraries and frameworks should use
`ConfigureAwait(false)`

Async all the way, don't mix blocking
and asynchronous code

Slides, Links...

github.com/danielmarbach/RearchitectTowardsAsyncAwait

await Q & A

Thanks