

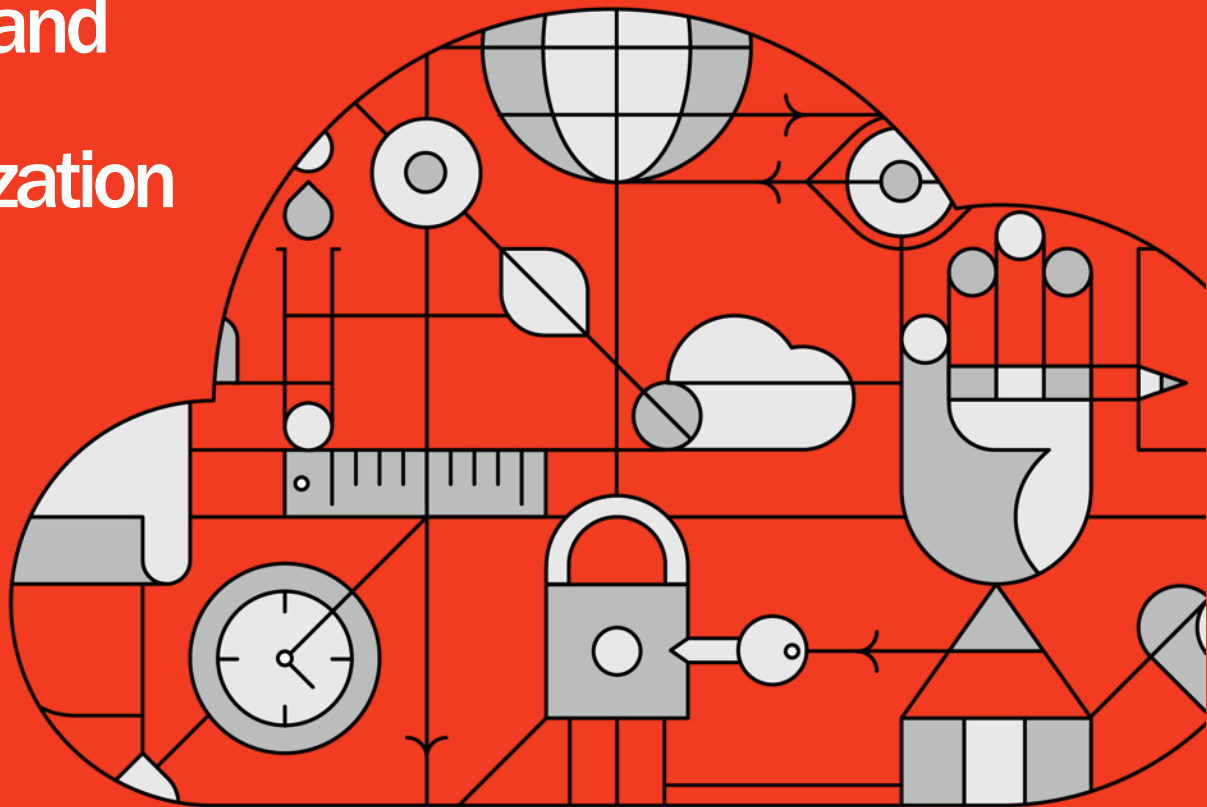
# Code best practices and performance optimization

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& EMVP



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Conference

## What to look at?

- Tools
- Distractions
- Scenarios
  - SessionState
  - Loading Content & EPiServer API
  - Cache
  - Race Condition Locks

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# Tools

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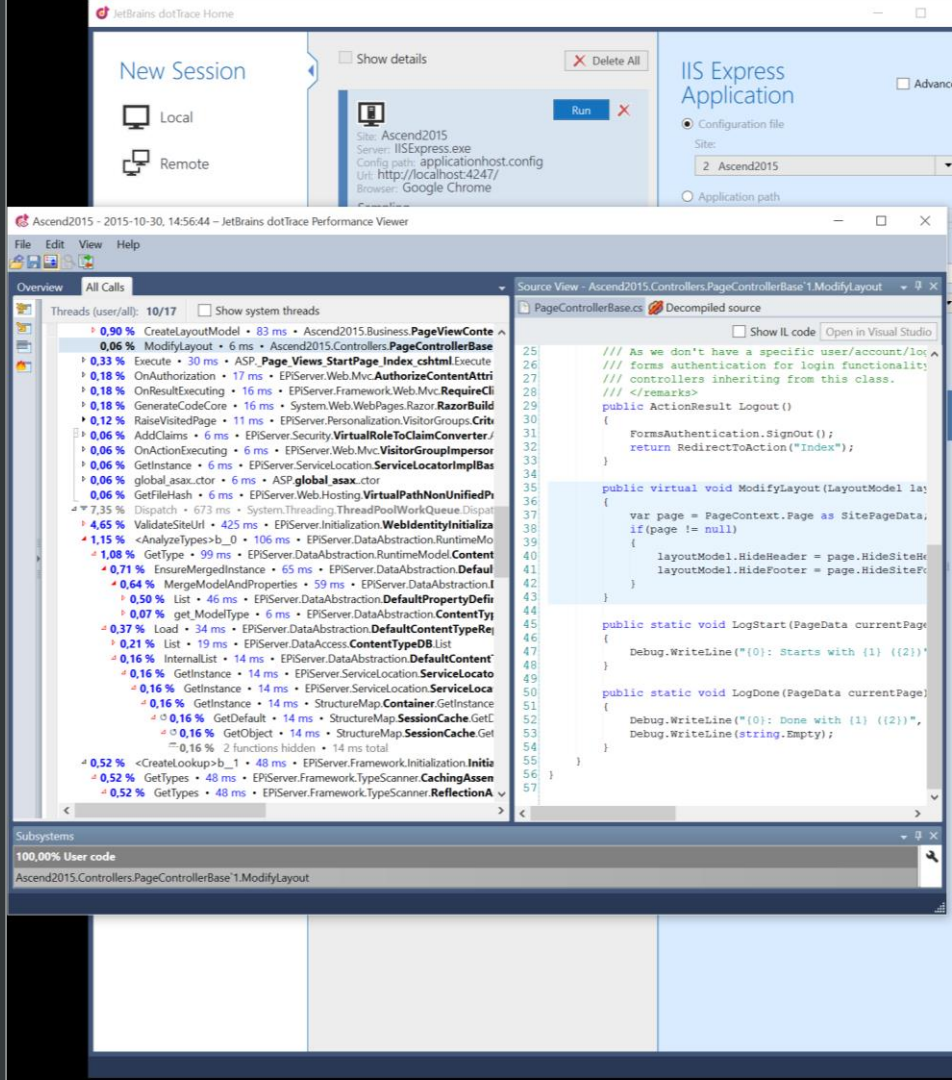
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## Tools

# DotTrace

- Monitor CPU & Memory usage
- Call number and time
- License cost
- Other options
  - Visual Studio
  - ANTS Performance Profiler

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# SQL Server Profiler

- Monitor database requests and CPU usage
- Can use lots of resources in production environment

SQL Server Profiler - [Untitled - 1 (TENNIF\SQLEXPRESS)]

File Edit View Replay Tools Window Help

EventClass	TextData	ApplicationName	NTUserName	LoginName	CPU	Reads
RPC:Completed	exec netContentDataLoad @ContentID=...	.Net SqlClie...		dbuser	0	34
Audit Logout		.Net SqlClie...		dbuser	0	3106
RPC:Completed	exec sp_reset_connection	.Net SqlClie...		dbuser	0	0
Audit Login	-- network protocol: LPC set quote...	.Net SqlClie...		dbuser		
RPC:Completed	exec netFindContentCoreDataByConten...	.Net SqlClie...		dbuser	0	6
Audit Logout		.Net SqlClie...		dbuser	0	3112
RPC:Completed	exec sp_reset_connection	.Net SqlClie...		dbuser	0	0
Audit Login	-- network protocol: LPC set quote...	.Net SqlClie...		dbuser		
RPC:Completed	exec netContentDataLoad @ContentID=...	.Net SqlClie...		dbuser	0	35
Audit Logout		.Net SqlClie...		dbuser	0	3147
RPC:Completed	exec sp_reset_connection	.Net SqlClie...		dbuser	0	0
Audit Login	-- network protocol: LPC set quote...	.Net SqlClie...		dbuser		
RPC:Completed	exec netFindContentCoreDataByConten...	.Net SqlClie...		dbuser	0	6
Audit Logout		.Net SqlClie...		dbuser	0	3153
RPC:Completed	exec sp_reset_connection	.Net SqlClie...		dbuser	0	0
Audit Login	-- network protocol: LPC set quote...	.Net SqlClie...		dbuser		
RPC:Completed	exec netContentDataLoad @ContentID=...	.Net SqlClie...		dbuser	0	44
Audit Logout		.Net SqlClie...		dbuser	0	3197
RPC:Completed	exec sp_reset_connection	.Net SqlClie...		dbuser	0	0
Audit Login	-- network protocol: LPC set quote...	.Net SqlClie...		dbuser		
RPC:Completed	exec netFindContentCoreDataByConten...	.Net SqlClie...		dbuser	0	6
Audit Logout		.Net SqlClie...		dbuser	0	3203
RPC:Completed	exec sp_reset_connection	.Net SqlClie...		dbuser	0	0
Audit Login	-- network protocol: LPC set quote...	.Net SqlClie...		dbuser		
RPC:Completed	exec netContentDataLoad @ContentID=...	.Net SqlClie...		dbuser	0	44
Audit Logout		.Net SqlClie...		dbuser	0	3247
RPC:Completed	exec sp_reset_connection	.Net SqlClie...		dbuser	0	0
Audit Login	-- network protocol: LPC set quote...	.Net SqlClie...		dbuser		
RPC:Completed	exec netFindContentCoreDataByConten...	.Net SqlClie...		dbuser	0	6
Audit Logout		.Net SqlClie...		dbuser	0	3253
RPC:Completed	exec sp_reset_connection	.Net SqlClie...		dbuser	0	0
Audit Login	-- network protocol: LPC set quote...	.Net SqlClie...		dbuser		
RPC:Completed	exec netContentDataLoad @ContentID=...	.Net SqlClie...		dbuser	0	30
Audit Logout		.Net SqlClie...		dbuser	0	3283
RPC:Completed	exec sp_reset_connection	.Net SqlClie...		dbuser	0	0
Audit Login	-- network protocol: LPC set quote...	.Net SqlClie...		dbuser		
RPC:Completed	exec netContentDataLoad @ContentID=...	.Net SqlClie...		dbuser	0	22

exec netContentDataLoad @ContentID=48,@LanguageBranchID=-1

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# Distractions

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# Scheduled Jobs

## Executes code

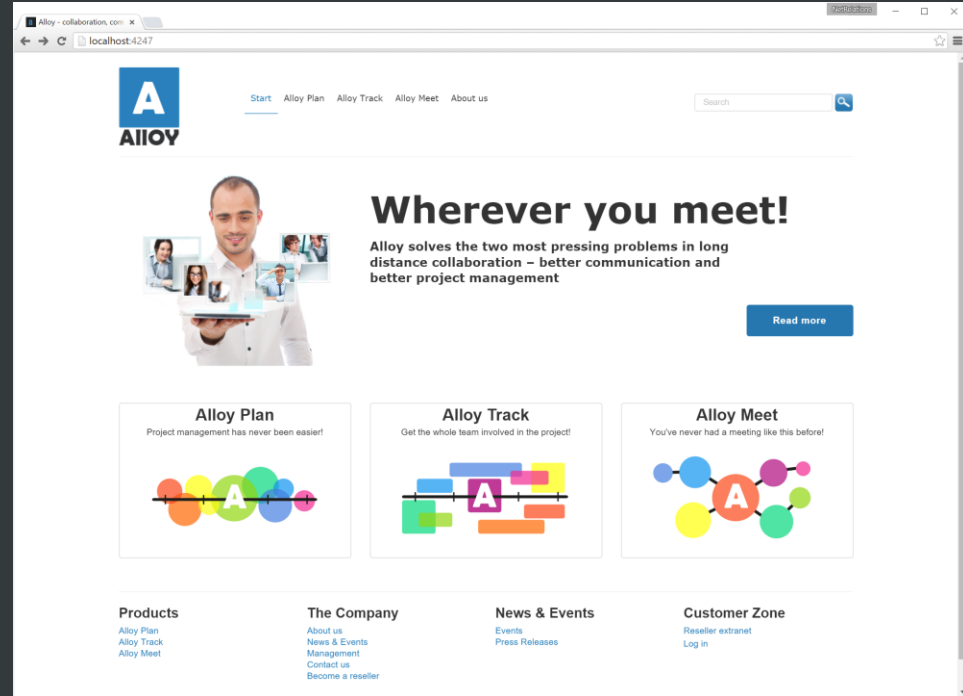
- Often complex and heavy
- Sometimes very frequently

- Configuration

```
<configuration>  
  <episerver>  
    <applicationSettings  
      enableScheduler="false" />  
  </episerver>  
</configuration>
```

## Frontend resources

- Creates requests to server
- Requests to Media can cause database traffic





### Frontend resources

- Creates requests to server
- Requests to Media can cause database traffic

### Example of tools

- LINQPad – [www.linqpad.net](http://www.linqpad.net)
- Postman Chrome plugin
- Create a console application

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# Scenarios

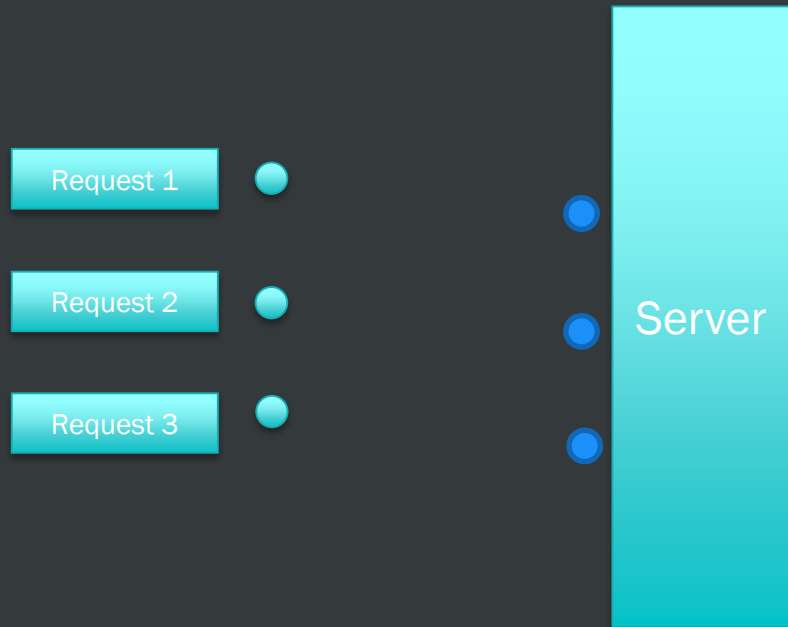
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# SessionState

Server queues incoming requests to handle session information between requests

- Enabled by default in .NET
- Practice at NetRelations to disable to increase speed



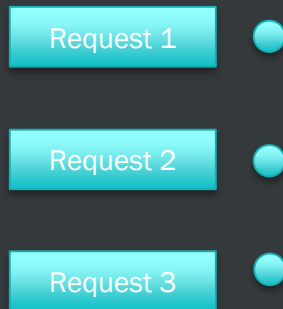
# SessionState

## MVC

```
[SessionState(SessionStateBehavior.Disabled)]
```

## WebForms

```
<%@ Page EnableSessionState="false" ... %>
```



Server



## What about the sessions?

Do you need them?

Save session key into cookie (*beware of regional laws*)

Store information on server

Some VisitorGroups and Add-ons use SessionState

# Cut to the code

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# Loading Content & EPiServer API

- GetChildren
- GetDescendents + Get
- GetDescendents + GetItems
- FindPagesWithCriteria

### Loading Content - GetChildren

- + Easy
- Need to iterate and recurse for each child
- Very expensive if big page tree!



# Cut to the code

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### Loading Content – GetDescendents & Get

- + Optimized for tree structure - don't need to iterate and recurse
- Returns ContentReference and needs to Get content
- Expensive if big page tree

# Cut to the code

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### Loading Content – GetDescendents & GetItems

- + Faster than get each content
- + Use when having multiple ContentReferences
- Expensive if big page tree

# Cut to the code

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### Loading Content – FindPagesWithCriteria

- + One database call to find pages
  - + Stored Procedure netPropertySearchValueMeta
- + Good in a big tree structure
- Does only work with Pages
- Does not cache!

# Cut to the code

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# Caching

- *ObjectInstanceCache* and *ISynchronizedObjectInstanceCache* wraps `HttpRuntime.Cache`
- *ISynchronizedObjectInstanceCache* synchronizes in a load balanced environment
- *CacheEvictionPolicy* to clear out cache when needed



## ISynchronizedObjectInstanceCache

```
var cache = ServiceLocator.Current  
.GetInstance<ISynchronizedObjectInstanceCache>();
```

```
cache.Insert(key, value, cacheEvictionPolicy);
```

```
cache.Remove(cacheKey, value, cacheEvictionPolicy);
```



## CacheEvictionPolicy - cacheKeys

```
new CacheEvictionPolicy(new string[] { "cacheKey" });
```

- Make cached object dependant on previously cached keys being updated or removed
- Won't cache if depending key is not already cached

```
cache.Insert("cacheKey2", cacheKeyCacheFactory(cacheEvictionPolicy, new[] { "cacheKey1" }));
```

Server

cacheKey1 → No "cacheKey1"! → cacheKey2

# CacheEvictionPolicy - masterKeys

```
new CacheEvictionPolicy(
```

```
    null, // for files
```

```
    null, // for cacheKeys
```

```
    new string[] { "masterKey" });
```

- Same as cacheKeys, but does not require key to already be cached

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# Race Condition Locks

Important when using resources that takes long time and can't handle usages by multiple threads, such as reading or writing files on disk!

- Locking
- Mini Locking

### Race Condition Locks - Simple lock

- Prevents exceptions and that the system locks because of multiple threads using the same resource
- Queues threads that want to use locked functionality

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### Mini Locking

- If only using a simple lock, threads are locking up even if they don't need to
- Mini locks are more granular and only queues up threads based on keys



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# Wanna play?

[github.com/alfnilsson/ascend2015](https://github.com/alfnilsson/ascend2015)

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## Questions?

Judge of a man by his questions  
rather than by his answers.

*Voltaire*

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Thanks and have a good Ascend!

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github.com/alfnilsson



<http://talk.alfnilsson.se>