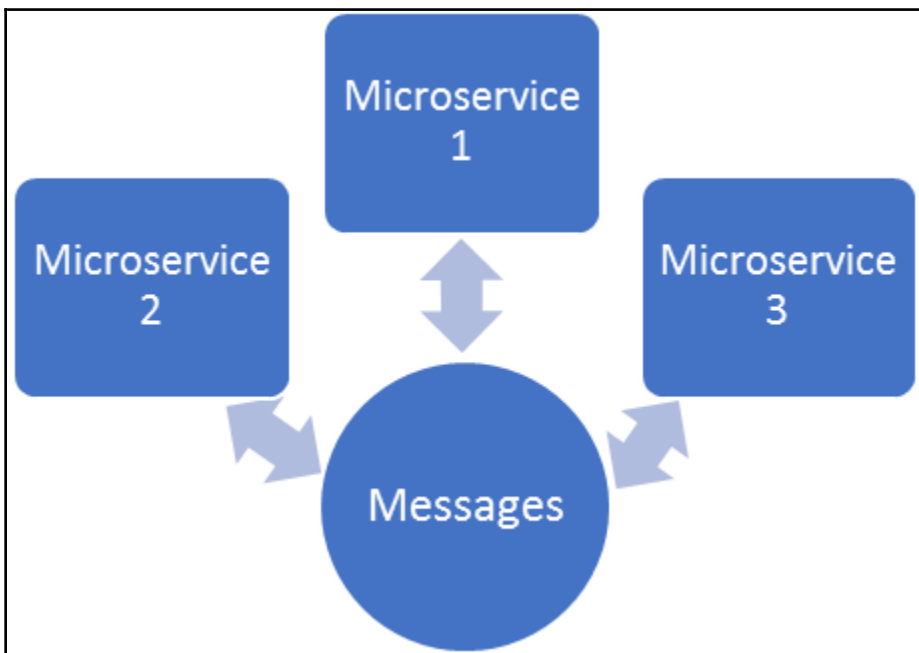
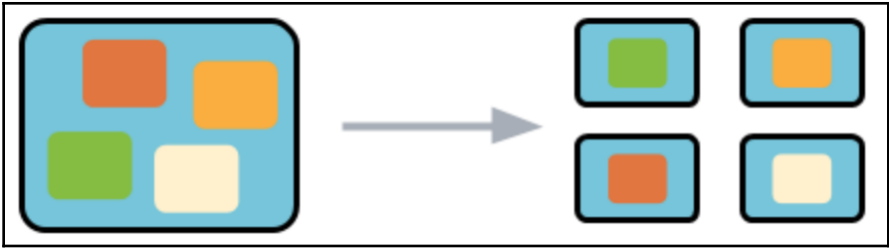
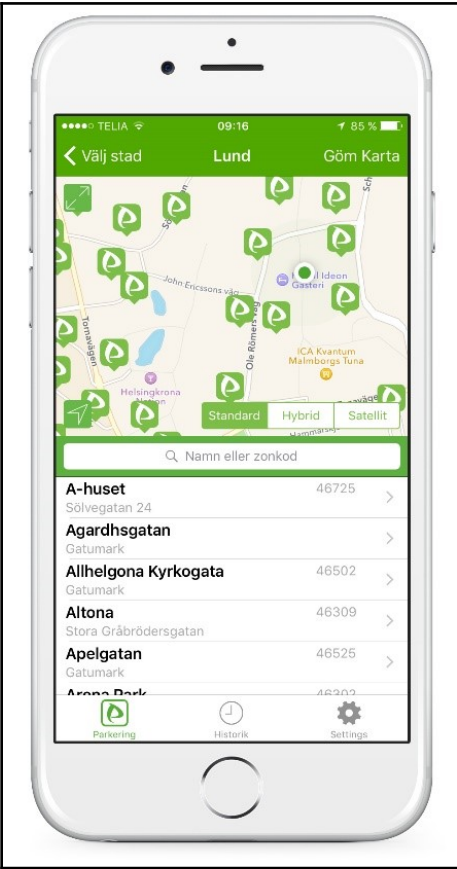
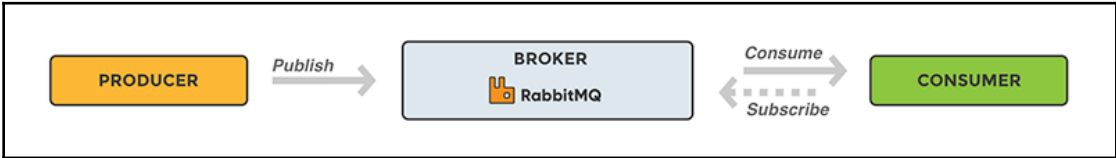
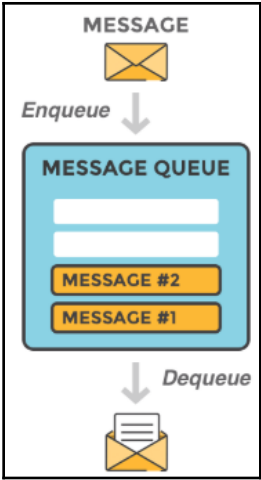


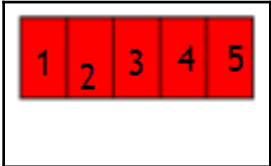
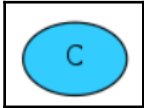
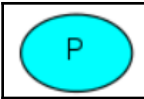
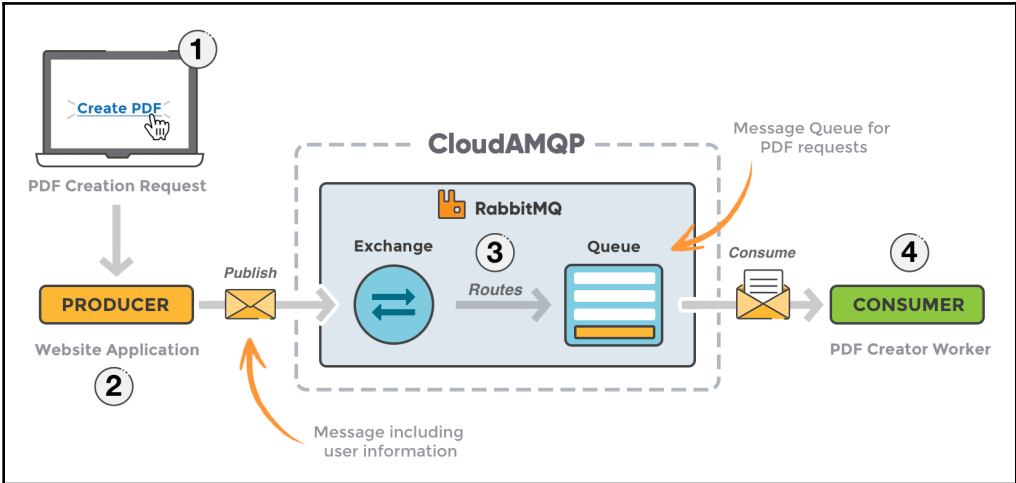
Graphic Bundle

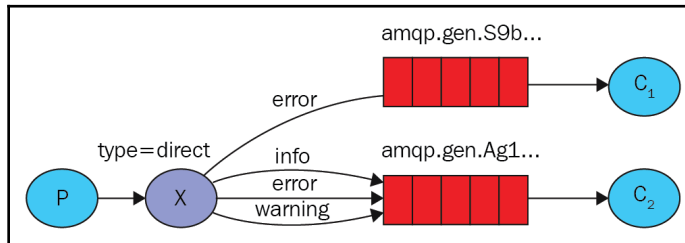
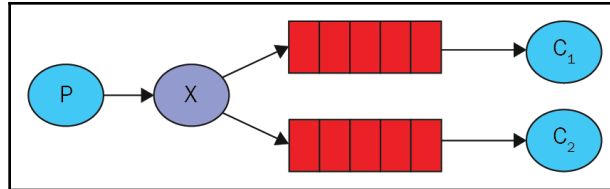
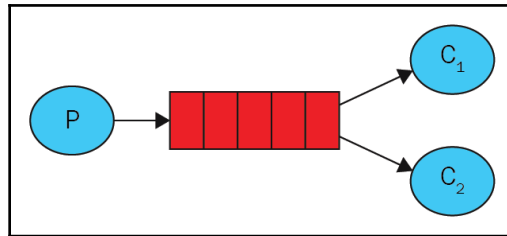
Chapter 1: Let's Talk Microservices, Messages, and Tools

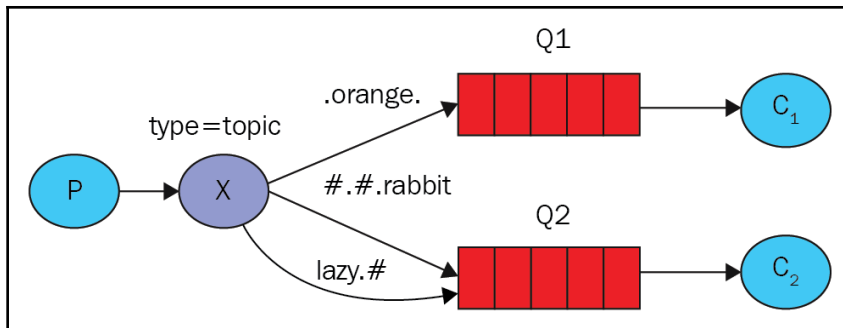
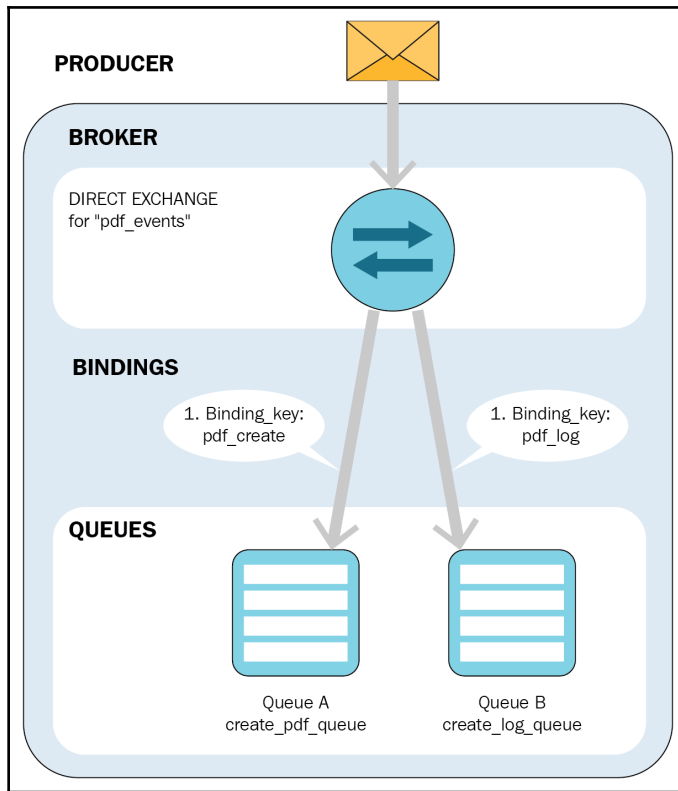


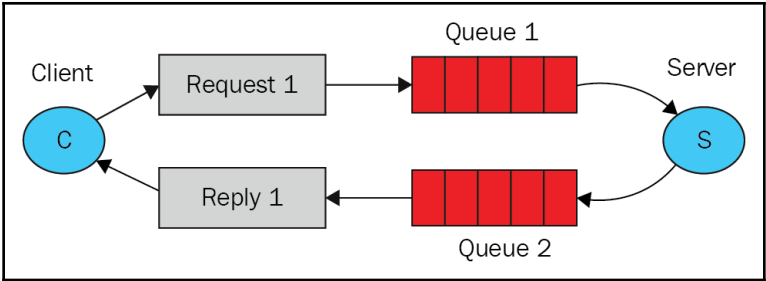
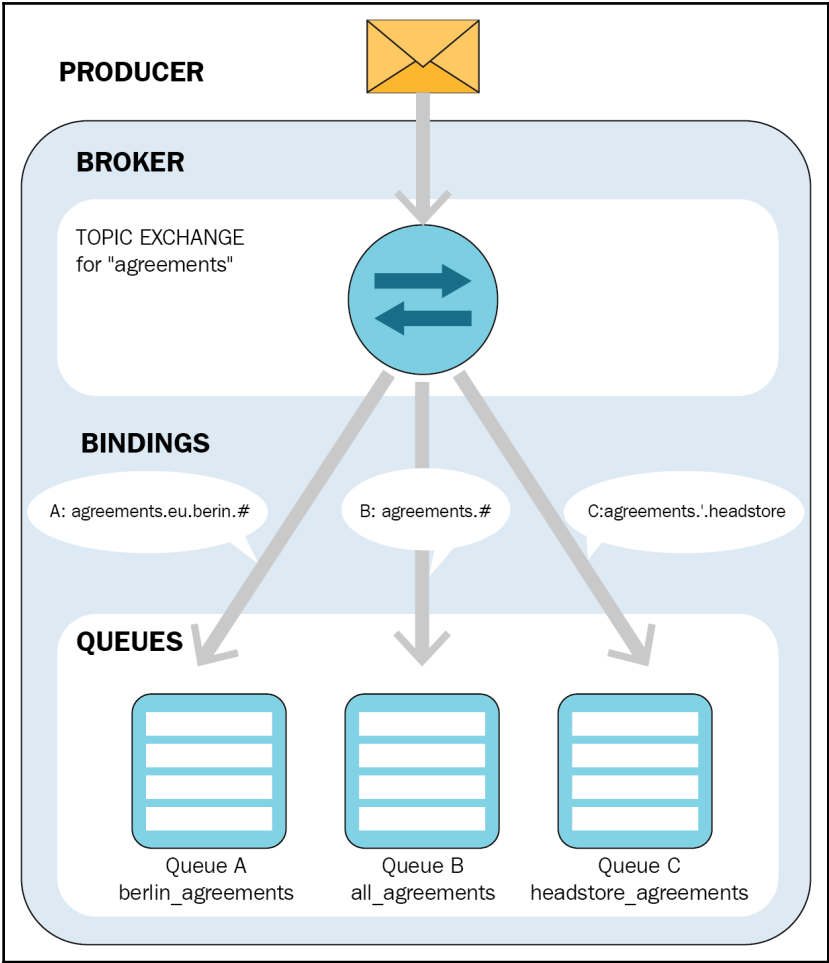


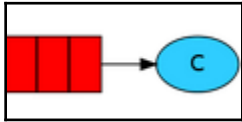
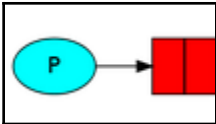
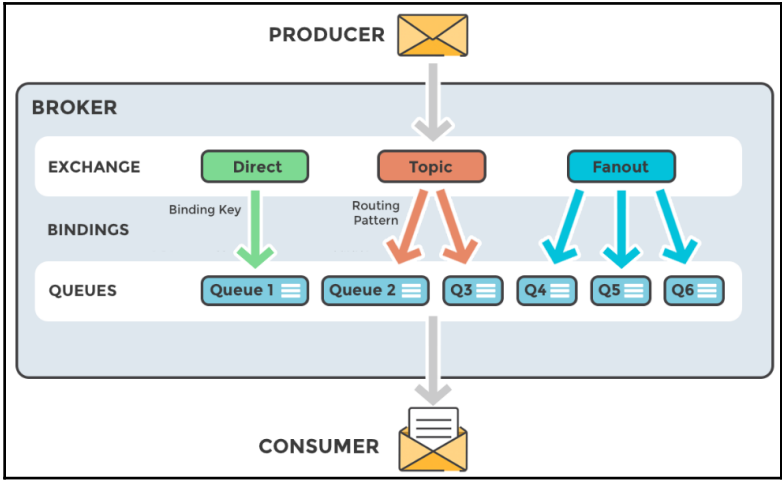


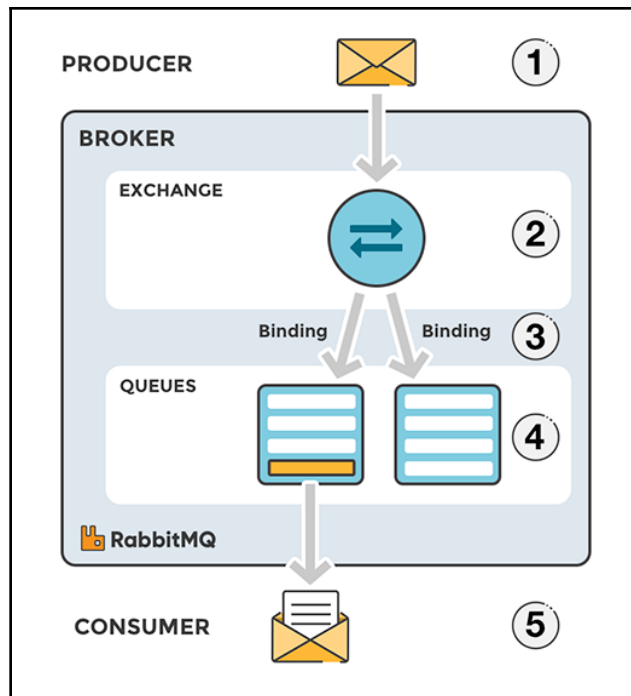
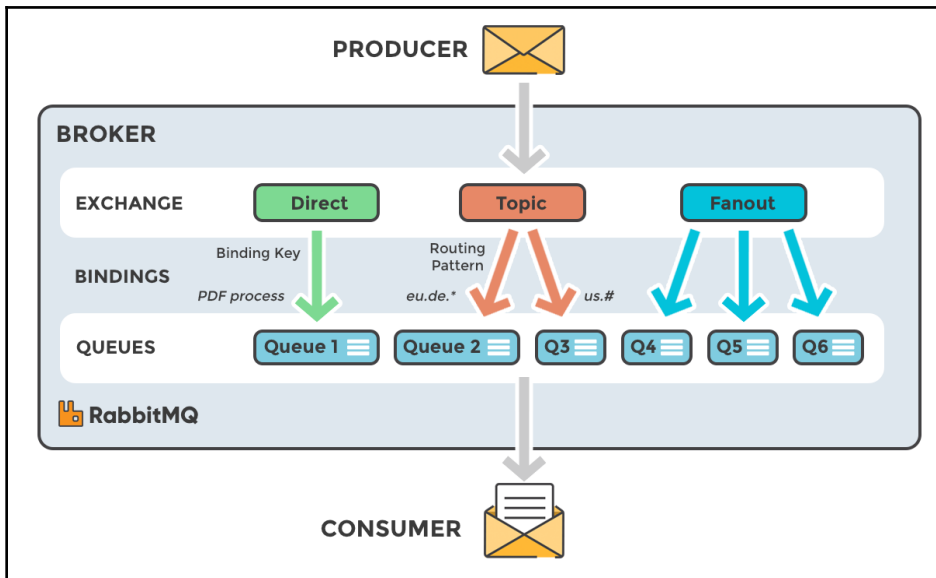


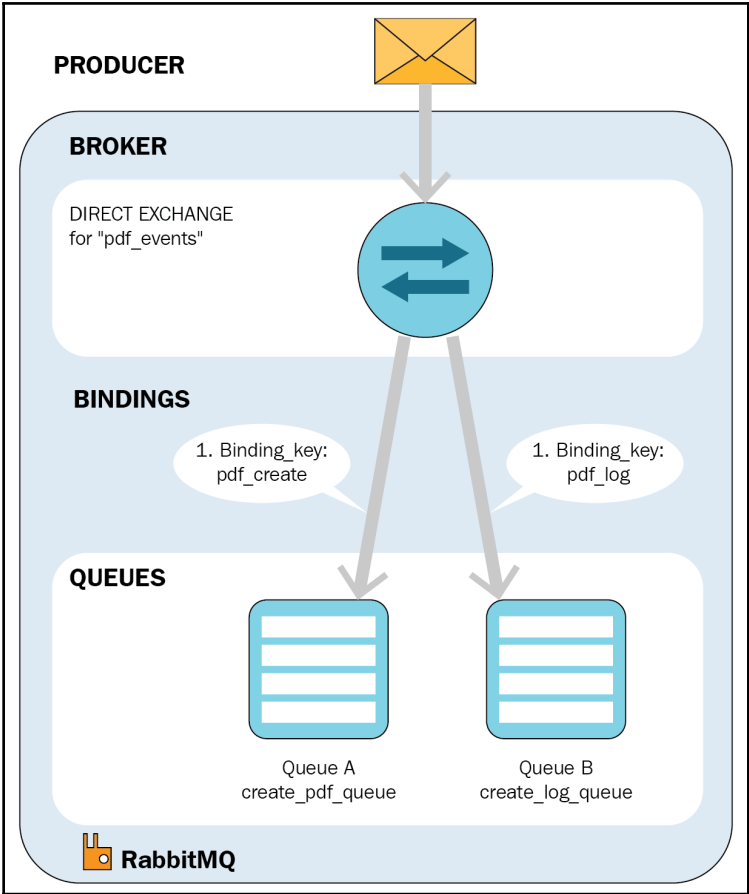


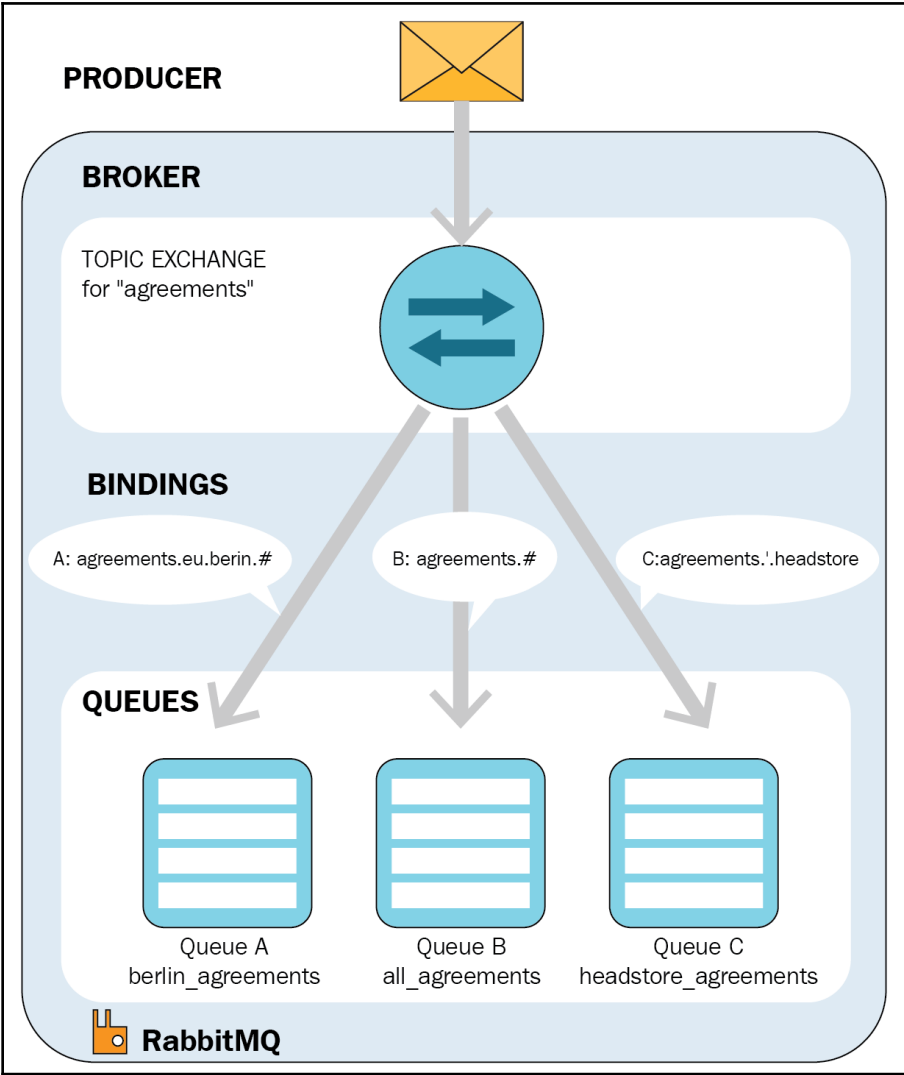


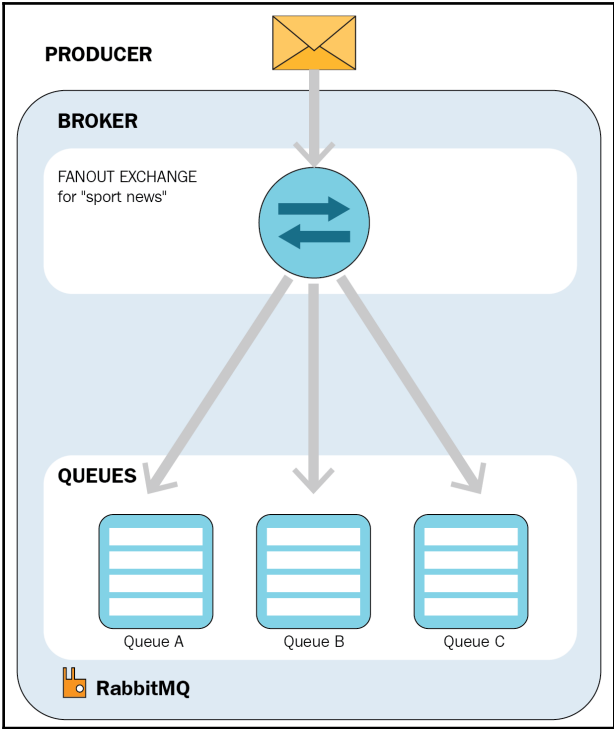


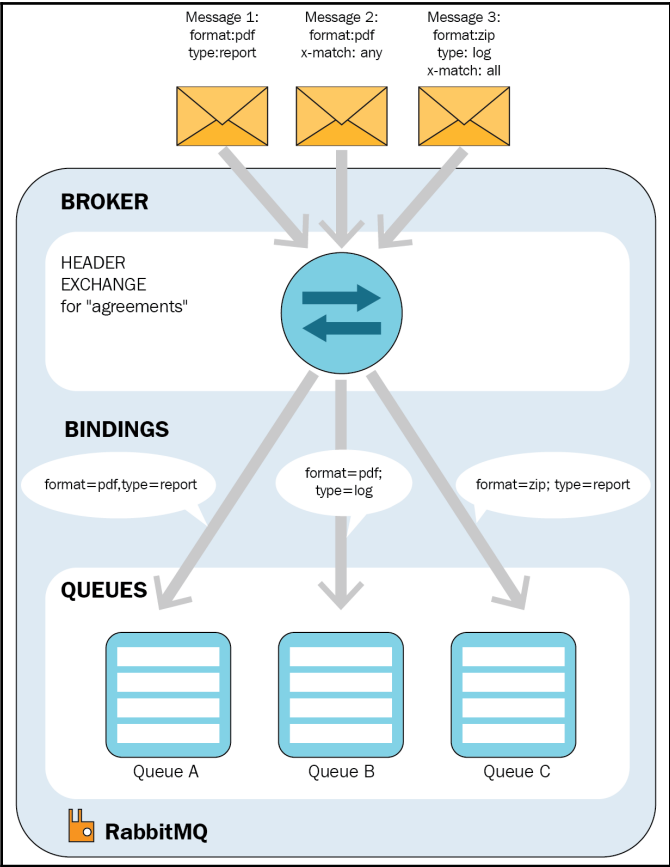




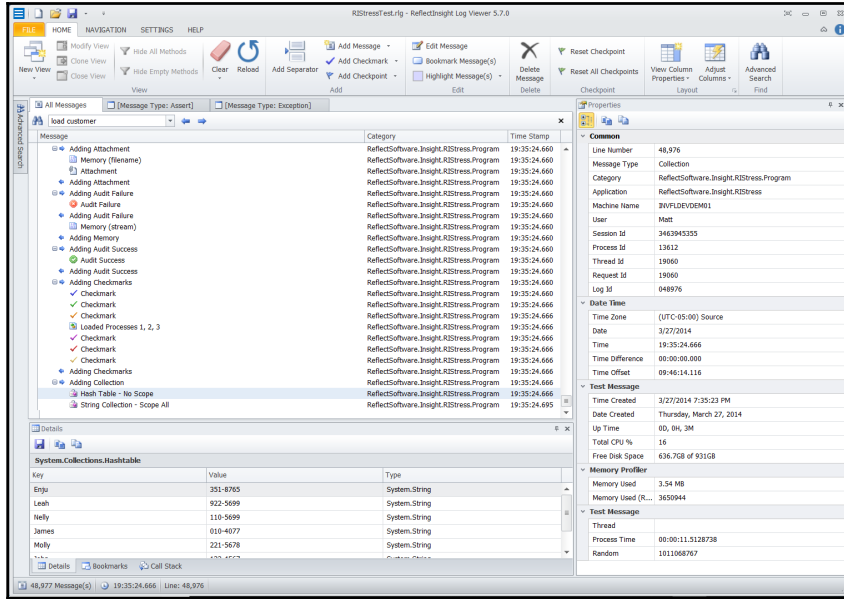








Chapter 2: ReflectInsight – Microservice Logging Redefined



The screenshot displays the Reflect Software Insight RISStress Log Viewer 5.7.0 interface. The main window shows a list of messages with columns for Message, Category, and Time Stamp. The selected message is an internal exception with the following details:

```

Internal Exception:<SendFatal>[FormatException->Index (zero based) must be greater than or equal to zero and less than the size of the array]
The following exception occurred:
1) Exception Information
-----
Exception Type: System.FormatException
Message: Index (zero based) must be greater than or equal to zero and less than the size of the array
Data: System.Collections.ListDictionaryInternal
TargetSite: System.Text.StringBuilder.AppendFormat(System.IFormatProvider, System.String, System.Object[])
HelpLink: NULL
Source: mscorlib
HResult: -2146233033
Stack Trace Information
-----
   at System.Text.StringBuilder.AppendFormat(IFormatProvider provider, String format, Object[] args)
   at System.String.Format(IFormatProvider provider, String format, Object[] args)
    
```

The Properties pane on the right provides additional context:

- Common:** Line Number: 48,666; Message Type: Internal Error; Category: ReflectSoftware.Insight.RISStress.Program; Application: ReflectSoftware.Insight.RISStress; Machine Name: DIVFLDEVDEM01; User: Matt; Session Id: 3463945355; Process Id: 13612; Thread Id: 35124; Request Id: 35124; Log Id: 048666.
- Date Time:** Time Zone: (UTC-05:00) Source; Date: 3/27/2014; Time: 19:35:23.619; Time Difference: 00:00:00.000; Time Offset: 09:46:13.069.
- Test Message:** Time Created: 3/27/2014 7:35:19 PM; Date Created: Thursday, March 27, 2014; Up Time: 00, 0h, 3m; Total CPU %: 38; Free Disk Space: 636.7GB of 931GB.
- Memory Profiler:** Memory Used: 1.26 MB; Memory Used (R...): 1324200.
- Test Message:** Thread: Random; Process Time: 00:00:03.0888198; Random: 1646595029.

The status bar at the bottom indicates: 48,977 Message(s) | 19:35:23.619 | Line: 48,666

ReflectInsight Log Viewer 5.7.0

Message

Message	Date	Time Stamp
Generation: 4637/5000, Time/gen: 709 ms, Est. time remaining: 00h:04m:17s:367ms Fitness - Max: 4.9502 Mean: 0.8294, Complexity - Max: 166 Mean: 142.06 Champ: 145 Strategy: ...	1/8/2018	08:16:41.696
Generation: 4647/5000, Time/gen: 691 ms, Est. time remaining: 00h:04m:03s:922ms Fitness - Max: 5.6441 Mean: 0.6120, Complexity - Max: 163 Mean: 134.50 Champ: 163 Strategy: ...	1/8/2018	08:16:47.972
Generation: 4657/5000, Time/gen: 701 ms, Est. time remaining: 00h:04m:00s:443ms Fitness - Max: 4.9756 Mean: 0.5073, Complexity - Max: 160 Mean: 143.86 Champ: 160 Strategy: ...	1/8/2018	08:16:54.994
Generation: 4667/5000, Time/gen: 733 ms, Est. time remaining: 00h:04m:04s:089ms Fitness - Max: 5.1262 Mean: 0.7258, Complexity - Max: 157 Mean: 143.43 Champ: 156 Strategy: ...	1/8/2018	08:17:02.321
Generation: 4677/5000, Time/gen: 729 ms, Est. time remaining: 00h:03m:55s:467ms Fitness - Max: 4.6804 Mean: 0.8399, Complexity - Max: 153 Mean: 133.69 Champ: 151 Strategy: ...	1/8/2018	08:17:09.616
Generation: 4688/5000, Time/gen: 1617 ms, Est. time remaining: 00h:03m:24s:504ms Fitness - Max: 4.8536 Mean: 0.7850, Complexity - Max: 150 Mean: 145.93 Champ: 146 Strategy: ...	1/8/2018	08:17:27.409
Generation: 4698/5000, Time/gen: 742 ms, Est. time remaining: 00h:03m:44s:084ms Fitness - Max: 5.0929 Mean: 0.8337, Complexity - Max: 148 Mean: 143.39 Champ: 145 Strategy: ...	1/8/2018	08:17:34.840
Generation: 4708/5000, Time/gen: 741 ms, Est. time remaining: 00h:03m:36s:372ms Fitness - Max: 4.8712 Mean: 0.6593, Complexity - Max: 144 Mean: 139.84 Champ: 142 Strategy: ...	1/8/2018	08:17:42.255
Generation: 4718/5000, Time/gen: 721 ms, Est. time remaining: 00h:03m:23s:322ms Fitness - Max: 4.8545 Mean: 0.4845, Complexity - Max: 139 Mean: 135.11 Champ: 137 Strategy: ...	1/8/2018	08:17:49.465
Generation: 4728/5000, Time/gen: 736 ms, Est. time remaining: 00h:03m:19s:2ms Fitness - Max: 4.8083 Mean: 0.5670, Complexity - Max: 135 Mean: 129.95 Champ: 132 Strategy: ...	1/8/2018	08:17:56.827
Generation: 4738/5000, Time/gen: 723 ms, Est. time remaining: 00h:03m:09s:426ms Fitness - Max: 5.0115 Mean: 0.6186, Complexity - Max: 131 Mean: 128.17 Champ: 128 Strategy: ...	1/8/2018	08:18:04.063
Generation: 4748/5000, Time/gen: 704 ms, Est. time remaining: 00h:02m:57s:708ms Fitness - Max: 5.0922 Mean: 0.6899, Complexity - Max: 130 Mean: 124.38 Champ: 127 Strategy: ...	1/8/2018	08:18:11.103
Generation: 4759/5000, Time/gen: 783 ms, Est. time remaining: 00h:03m:06s:703ms Fitness - Max: 4.8821 Mean: 0.7472, Complexity - Max: 124 Mean: 120.59 Champ: 119 Strategy: ...	1/8/2018	08:18:19.726
Generation: 4769/5000, Time/gen: 695 ms, Est. time remaining: 00h:02m:40s:546ms Fitness - Max: 5.3183 Mean: 0.7492, Complexity - Max: 119 Mean: 116.25 Champ: 117 Strategy: ...	1/8/2018	08:18:26.685
Generation: 4779/5000, Time/gen: 689 ms, Est. time remaining: 00h:02m:32s:269ms Fitness - Max: 5.4802 Mean: 0.4926, Complexity - Max: 117 Mean: 112.30 Champ: 117 Strategy: ...	1/8/2018	08:18:33.575
Generation: 4789/5000, Time/gen: 682 ms, Est. time remaining: 00h:02m:23s:902ms Fitness - Max: 4.7408 Mean: 0.3504, Complexity - Max: 113 Mean: 108.89 Champ: 110 Strategy: ...	1/8/2018	08:18:40.393
Generation: 4799/5000, Time/gen: 709 ms, Est. time remaining: 00h:02m:15s:509ms Fitness - Max: 4.7041 Mean: 0.4322, Complexity - Max: 108 Mean: 104.73 Champ: 107 Strategy: ...	1/8/2018	08:18:47.488
Generation: 4809/5000, Time/gen: 700 ms, Est. time remaining: 00h:02m:13s:700ms Fitness - Max: 4.9714 Mean: 0.3853, Complexity - Max: 106 Mean: 102.09 Champ: 102 Strategy: ...	1/8/2018	08:18:54.497
Generation: 4819/5000, Time/gen: 676 ms, Est. time remaining: 00h:02m:02s:356ms Fitness - Max: 4.1453 Mean: 0.6431, Complexity - Max: 104 Mean: 102.02 Champ: 100 Strategy: ...	1/8/2018	08:19:01.265
Generation: 4829/5000, Time/gen: 1136 ms, Est. time remaining: 00h:03m:14s:256ms Fitness - Max: 4.6362 Mean: 0.5285, Complexity - Max: 103 Mean: 99.59 Champ: 103 Strategy: Sim...	1/8/2018	08:19:12.627
Generation: 4839/5000, Time/gen: 710 ms, Est. time remaining: 00h:02m:14s:10ms Fitness - Max: 4.4119 Mean: 0.5784, Complexity - Max: 93 Mean: 92.17 Champ: 93 Strategy: Sim...	1/8/2018	08:19:19.736
Generation: 4849/5000, Time/gen: 658 ms, Est. time remaining: 00h:02m:13s:388ms Fitness - Max: 4.4119 Mean: 0.5912, Complexity - Max: 92 Mean: 89.98 Champ: 90 Strategy: Sim...	1/8/2018	08:19:26.319
Generation: 4859/5000, Time/gen: 672 ms, Est. time remaining: 00h:02m:14s:752ms Fitness - Max: 4.5665 Mean: 0.3949, Complexity - Max: 89 Mean: 87.14 Champ: 87 Strategy: Sim...	1/8/2018	08:19:33.042
Generation: 4869/5000, Time/gen: 661 ms, Est. time remaining: 00h:02m:12s:591ms Fitness - Max: 4.3348 Mean: 0.4482, Complexity - Max: 89 Mean: 85.89 Champ: 85 Strategy: Sim...	1/8/2018	08:19:39.656
Generation: 4879/5000, Time/gen: 672 ms, Est. time remaining: 00h:02m:11s:12ms Fitness - Max: 4.3044 Mean: 0.5053, Complexity - Max: 87 Mean: 84.66 Champ: 78 Strategy: Sim...	1/8/2018	08:19:46.384
Generation: 4889/5000, Time/gen: 678 ms, Est. time remaining: 00h:02m:15s:289ms Fitness - Max: 4.2528 Mean: 0.3227, Complexity - Max: 85 Mean: 78.68 Champ: 73 Strategy: Sim...	1/8/2018	08:19:53.173
Generation: 4899/5000, Time/gen: 650 ms, Est. time remaining: 00h:02m:13s:650ms Fitness - Max: 4.5200 Mean: 0.2909, Complexity - Max: 79 Mean: 70.39 Champ: 71 Strategy: Sim...	1/8/2018	08:19:59.681
Generation: 4909/5000, Time/gen: 673 ms, Est. time remaining: 00h:02m:11s:143ms Fitness - Max: 4.2046 Mean: 0.1588, Complexity - Max: 74 Mean: 66.12 Champ: 70 Strategy: Sim...	1/8/2018	08:20:06.419
Generation: 4919/5000, Time/gen: 673 ms, Est. time remaining: 00h:02m:11s:13ms Fitness - Max: 2.2081 Mean: 0.1180, Complexity - Max: 70 Mean: 61.08 Champ: 61 Strategy: Sim...	1/8/2018	08:20:13.155
Generation: 4929/5000, Time/gen: 637 ms, Est. time remaining: 00h:00m:54s:227ms Fitness - Max: 2.4500 Mean: 0.0290, Complexity - Max: 58 Mean: 56.24 Champ: 54 Strategy: Sim...	1/8/2018	08:20:19.534
Generation: 4939/5000, Time/gen: 618 ms, Est. time remaining: 00h:00m:57s:988ms Fitness - Max: 2.4339 Mean: 0.1098, Complexity - Max: 55 Mean: 53.44 Champ: 54 Strategy: Sim...	1/8/2018	08:20:25.717

Watches

Label	Value
Complexity - Mean	132.09
Champ	128
Strategy	Complexifyng
Specie size - Max	116
Specie size - Min	1
Generations since last improvement	129
Obj Objective Score	0.5661
SpecieSize0	1
SpecieSize1	3
SpecieSize2	218
SpecieSize3	63
SpecieSize4	4
SpecieSize5	5
SpecieSize6	3
SpecieSize7	1
SpecieSize8	1
SpecieSize9	1
SpecieMeanFitness0	4.3644
SpecieMeanFitness1	4.8557
SpecieMeanFitness2	0.5208
SpecieMeanFitness3	1.4864
SpecieMeanFitness4	3.4896
SpecieMeanFitness5	3.8416
SpecieMeanFitness6	4.3695
SpecieMeanFitness7	5.4745
SpecieMeanFitness8	4.1663
SpecieMeanFitness9	5.0560
SpecieMeanChamp0	130.000
SpecieMeanChamp1	124.0000
SpecieMeanChamp2	129.681
SpecieMeanChamp3	134.3175
SpecieMeanChamp4	128.7500
SpecieMeanChamp5	128.0000
SpecieMeanChamp6	138.0000
SpecieMeanChamp7	124.0000
SpecieMeanChamp8	124.0000
SpecieMeanChamp9	124.0000

Details

Generation: 128/5000, Time/gen: 580 ms, Est. time remaining: 00h:47m:05s:760ms Fitness - Max: 6.1410 Mean: 1.0057, Complexity - Max: 136 Mean: 127.99 Champ: 129 Strategy: Complexifying, Specie size - Max: 142 Min: 1, Generations since last improvement: 119

ReflectInsight Log Viewer 5.7.0

FILE HOME NAVIGATION SETTINGS HELP

Modify View Hide All Methods Add Message Edit Message
 Clone View Hide Empty Methods Clear Reload Add Separator Add Checkmark Bookmark Message(s)
 Close View View Add Add Checkpoint Highlight Message(s) Delete Message

All Messages [Message Type: Assert] [Message Type: Exception]

load customer

Message	Category	Time Stamp
✓ Checkmark	ReflectSoftware.Insight.R1Stress.Program	19:35:22.222
✓ Audit Success	ReflectSoftware.Insight.R1Stress.Program	19:35:22.222
✓ Audit Failure	ReflectSoftware.Insight.R1Stress.Program	19:35:22.222
✓ Checkmark	ReflectSoftware.Insight.R1Stress.Program	19:35:22.222
✓ Audit Failure	ReflectSoftware.Insight.R1Stress.Program	19:35:22.222
✓ Audit Failure	ReflectSoftware.Insight.R1Stress.Program	19:35:22.222
✓ Checkmark	ReflectSoftware.Insight.R1Stress.Program	19:35:22.273
➤ Adding Audit Success	ReflectSoftware.Insight.R1Stress.Program	19:35:22.273
✓ Checkmark	ReflectSoftware.Insight.R1Stress.Program	19:35:22.273
✓ Audit Success	ReflectSoftware.Insight.R1Stress.Program	19:35:22.273

The image shows a Windows Properties dialog box with a tree view on the left and a list of properties on the right. The tree view includes sections for Common, Date Time, Test Message, Memory Profiler, and another Test Message section. The properties are listed in a table format with labels on the left and values on the right.

Common	
Line Number	48,163
Message Type	Audit Failure
Category	ReflectSoftware.Insight.RISstress.Program
Application	ReflectSoftware.Insight.RISstress
Machine Name	INVFLDEVDEM01
User	Matt
Session Id	3463945355
Process Id	13612
Thread Id	33864
Request Id	33864
Log Id	048163

Date Time	
Time Zone	(UTC-05:00) Source
Date	3/27/2014
Time	19:35:22.222
Time Difference	00:00:00.000
Time Offset	09:46:11.672

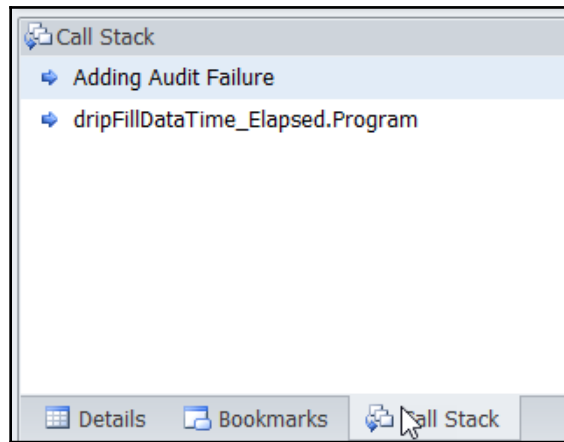
Test Message	
Time Created	3/27/2014 7:35:19 PM
Date Created	Thursday, March 27, 2014
Up Time	0D, 0H, 3M
Total CPU %	38
Free Disk Space	636.7GB of 931GB

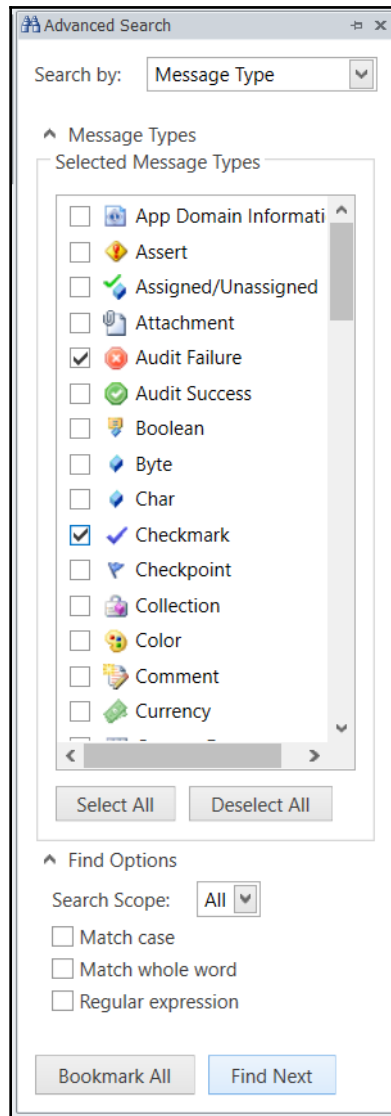
Memory Profiler	
Memory Used	1.26 MB
Memory Used (R...	1324200

Test Message	
Thread	
Process Time	00:00:03.2760210
Random	1535238345

Label	Value
Mode	train
LSTM Layer Size	200
Hidden Layers	lstm:200
Template Feature Size	174,751
Template Feature Context Size	174,751
Pretrained Dense Feature Size	200
Data\Corpus\NER_ENU\train.txt	619,076 records
Training Records	17
Data\Corpus\NER_ENU\valid.txt	32,828 records
Validation Records	17
Processor Count	12
Incremental Training	No
Random Value	0.463699321478465
Output Layer	simple
Sparse Feature Size	174751
Dense Feature Size	400
Max Seq Len	1,024
VQ	No
CRF Training	Yes
Minbatch Size	1
Is Const Alpha	No
Total RNNs	24
Learning Rate	0.1
Gradient Cutoff	1
Processed Sequence	7,624
Processed MiniBatch	27
Sentence Error Count	2,646
Iteration	6K/ 619.076K
Error token ratio	4.106604667183333%
Error sentence ratio	34.5666666666667%

View	Message	Date	Time	Line
<input type="checkbox"/> All Messages	Audit Failure	3/27/2014	19:35:22.222	48160
<input type="checkbox"/> All Messages	Audit Failure	3/27/2014	19:35:22.222	48162
<input type="checkbox"/> All Messages	Audit Failure	3/27/2014	19:35:22.222	48163






Time Display Format - Main View

Time Format: ⓘ ▼

Time Zone Type: ⓘ ▼

Apply to all views now ⓘ

Customizations: ⓘ

 Customize how AutoSave and AutoPurge are handled

Auto Save/Purge

Select either Auto Save or Auto Purge for the Viewer:

Auto Save

This option tells ReflectInsight to save the current visual logged messages to a physical log file when a certain criteria has been met. After the file has been Auto Saved, ReflectInsight will clear the current visual logged messages in preparation of new incoming messages.

Save on New Day

Save User Define Views during Auto Save ⓘ

Message Limit: ⓘ 1000 ————— 1,000,000

File Size Limit: ⓘ 0 ————— 102,400 MB

File Recycle Limit: ⓘ 0 ————— 100

Auto Purge

This option tells ReflectInsight to purge the top visual logged messages by a top amount, whereby, removing it from the Viewer's memory, when a message limit has been reached. Please note: ReflectInsight will NOT save purged messages to a physical log file.

Message Limit: ⓘ 1000 ————— 1,000,000

Purge Top: ⓘ ▼

Customizations: ⓘ

The screenshot displays the Reflect Software Insight Log Viewer 5.7.0 interface. The main window shows a list of messages with columns for Message, Category, and Time Stamp. A context menu is open over the selected message, listing actions such as 'Column Properties', 'Message Highlights', 'Delete Message', and 'Add Message'. The 'Properties' pane on the right shows details for the selected message, including Line Number (48,941), Message Type (Loaded Assemblies), and Application (ReflectSoftware.Insight.RISStress.Program). The 'Details' pane at the bottom shows a table of loaded assemblies.

Assembly	Version	Culture	Strong Named	GAC
mscorlib	4.0.0.0	neutral	True	True
ReflectSoftware.Insight.RISStress	1.0.0.0	neutral	False	False
System	4.0.0.0	neutral	True	True
ReflectSoftware.Insight.Common	5.3.3519.8537	neutral	True	False

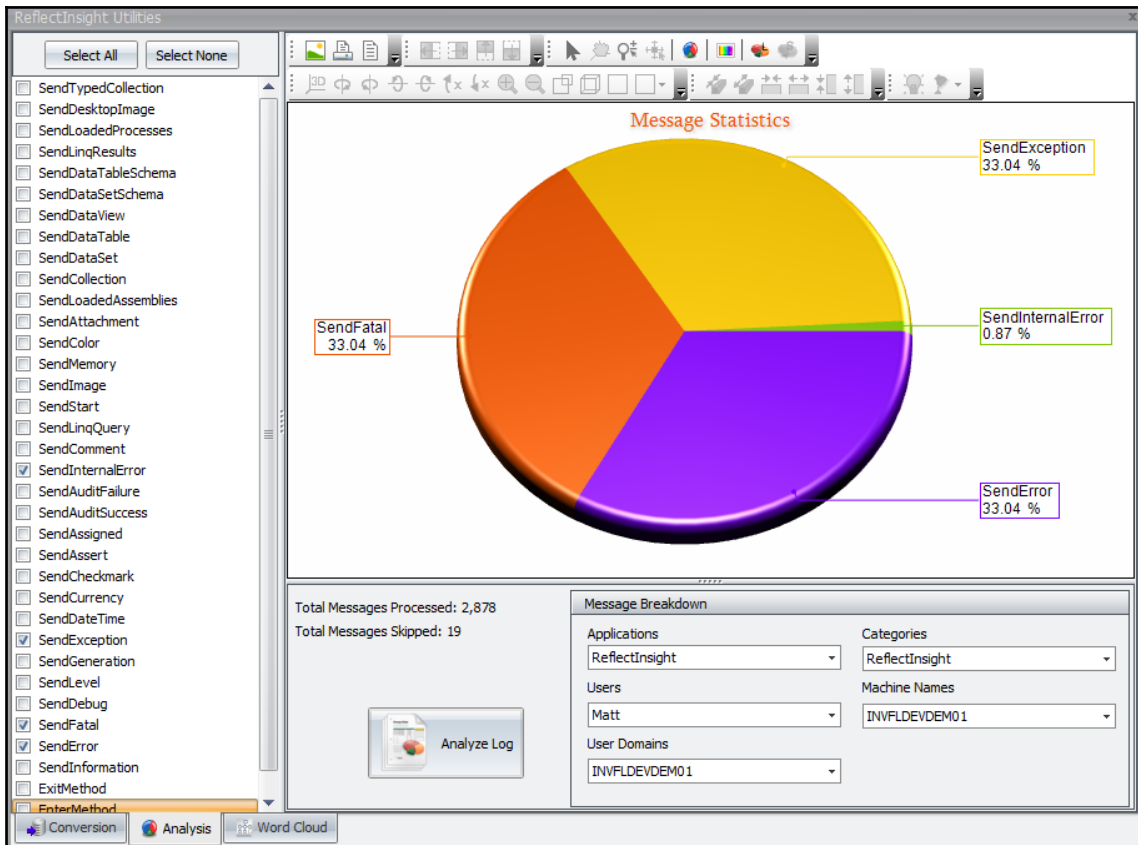
The screenshot displays the ReflectInsight Live Viewer 5.7.0 interface. The main window shows a list of messages with columns for Message, Date, and Time Stamp. The messages track various metrics like Fitness, Complexity, and Champ over multiple generations. A 'Details' panel at the bottom provides a closer look at a specific generation (128/5000), showing metrics such as Time/gen, Est. time remaining, Fitness, Complexity, and Champ. A 'Watches' panel on the right side of the interface lists various monitored metrics and their current values.

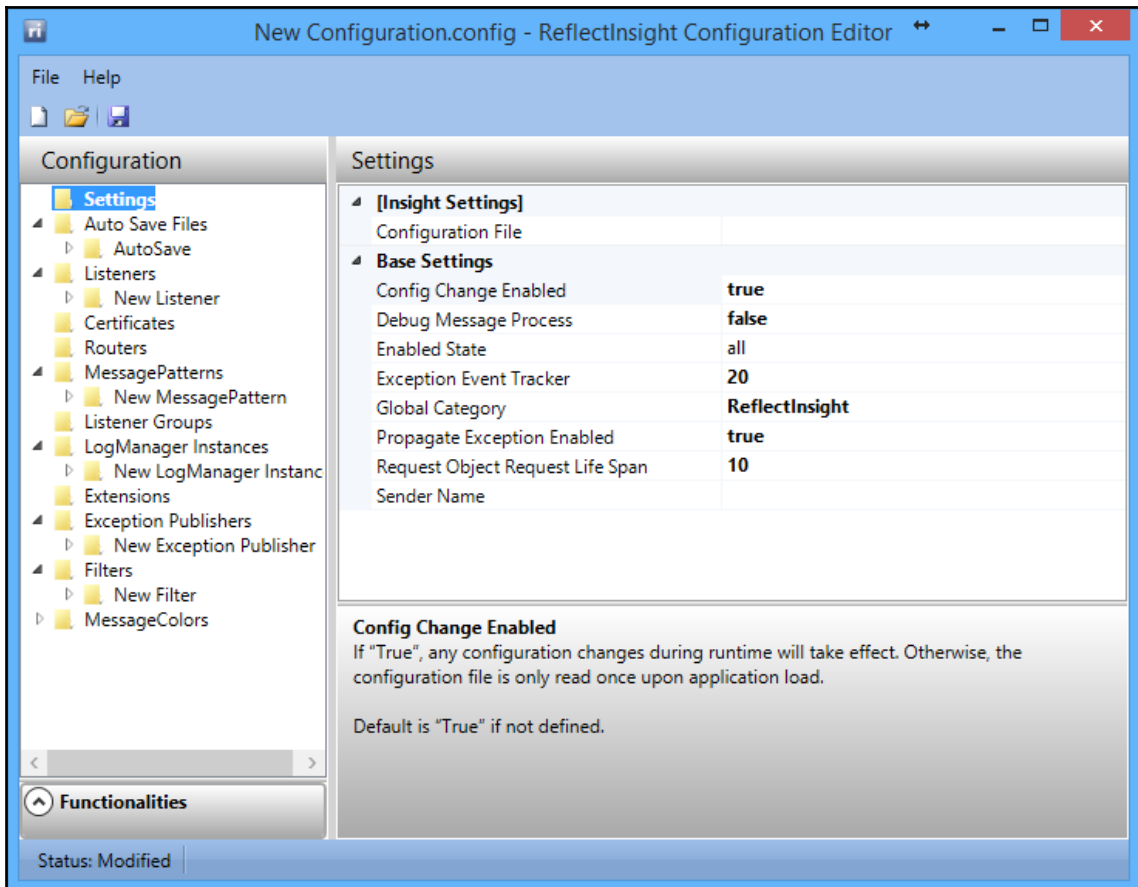
Message	Date	Time Stamp
Generation: 4637/5000, Time/gen: 709 ms, Est. time remaining: 00h:04m:17s:367ms Fitness - Max: 4.9502 Mean: 0.8294, Complexity - Max: 166 Mean: 142.06 Champ: 145 Strategy: ...	1/8/2018	08:16:41.056
Generation: 4647/5000, Time/gen: 691 ms, Est. time remaining: 00h:04m:15s:922ms Fitness - Max: 5.6441 Mean: 0.6120, Complexity - Max: 163 Mean: 134.50 Champ: 163 Strategy: ...	1/8/2018	08:16:47.972
Generation: 4657/5000, Time/gen: 701 ms, Est. time remaining: 00h:04m:20s:443ms Fitness - Max: 4.9756 Mean: 0.5073, Complexity - Max: 160 Mean: 143.86 Champ: 160 Strategy: ...	1/8/2018	08:16:54.994
Generation: 4667/5000, Time/gen: 733 ms, Est. time remaining: 00h:04m:04s:089ms Fitness - Max: 5.1262 Mean: 0.7258, Complexity - Max: 157 Mean: 143.43 Champ: 156 Strategy: ...	1/8/2018	08:17:02.321
Generation: 4677/5000, Time/gen: 729 ms, Est. time remaining: 00h:03m:55s:467ms Fitness - Max: 4.6804 Mean: 0.8399, Complexity - Max: 153 Mean: 133.69 Champ: 151 Strategy: ...	1/8/2018	08:17:09.616
Generation: 4688/5000, Time/gen: 1617 ms, Est. time remaining: 00h:03m:24s:504ms Fitness - Max: 4.8536 Mean: 0.7850, Complexity - Max: 150 Mean: 145.93 Champ: 146 Strategy: ...	1/8/2018	08:17:27.409
Generation: 4698/5000, Time/gen: 742 ms, Est. time remaining: 00h:03m:36s:372ms Fitness - Max: 4.8712 Mean: 0.6593, Complexity - Max: 148 Mean: 143.39 Champ: 145 Strategy: ...	1/8/2018	08:17:34.840
Generation: 4708/5000, Time/gen: 711 ms, Est. time remaining: 00h:03m:32s:322ms Fitness - Max: 4.8545 Mean: 0.4845, Complexity - Max: 139 Mean: 135.11 Champ: 137 Strategy: ...	1/8/2018	08:17:49.465
Generation: 4718/5000, Time/gen: 736 ms, Est. time remaining: 00h:03m:20s:192ms Fitness - Max: 5.0803 Mean: 0.5670, Complexity - Max: 135 Mean: 129.95 Champ: 132 Strategy: ...	1/8/2018	08:17:56.827
Generation: 4728/5000, Time/gen: 723 ms, Est. time remaining: 00h:03m:09s:426ms Fitness - Max: 5.0115 Mean: 0.6186, Complexity - Max: 131 Mean: 128.17 Champ: 128 Strategy: ...	1/8/2018	08:18:04.063
Generation: 4738/5000, Time/gen: 704 ms, Est. time remaining: 00h:02m:57s:408ms Fitness - Max: 5.0922 Mean: 0.6899, Complexity - Max: 130 Mean: 124.38 Champ: 127 Strategy: ...	1/8/2018	08:18:11.103
Generation: 4749/5000, Time/gen: 783 ms, Est. time remaining: 00h:03m:05s:703ms Fitness - Max: 4.8821 Mean: 0.7472, Complexity - Max: 124 Mean: 120.59 Champ: 119 Strategy: ...	1/8/2018	08:18:17.726
Generation: 4759/5000, Time/gen: 695 ms, Est. time remaining: 00h:02m:49s:549ms Fitness - Max: 5.3183 Mean: 0.7492, Complexity - Max: 119 Mean: 116.23 Champ: 117 Strategy: ...	1/8/2018	08:18:26.685
Generation: 4769/5000, Time/gen: 689 ms, Est. time remaining: 00h:02m:32s:269ms Fitness - Max: 5.4802 Mean: 0.4926, Complexity - Max: 117 Mean: 112.30 Champ: 117 Strategy: ...	1/8/2018	08:18:33.575
Generation: 4779/5000, Time/gen: 682 ms, Est. time remaining: 00h:02m:22s:902ms Fitness - Max: 4.7408 Mean: 0.3504, Complexity - Max: 113 Mean: 108.89 Champ: 110 Strategy: ...	1/8/2018	08:18:40.393
Generation: 4789/5000, Time/gen: 709 ms, Est. time remaining: 00h:02m:12s:509ms Fitness - Max: 4.7041 Mean: 0.4322, Complexity - Max: 108 Mean: 104.73 Champ: 107 Strategy: ...	1/8/2018	08:18:44.488
Generation: 4809/5000, Time/gen: 709 ms, Est. time remaining: 00h:02m:13s:700ms Fitness - Max: 4.9714 Mean: 0.3853, Complexity - Max: 106 Mean: 102.02 Champ: 102 Strategy: ...	1/8/2018	08:18:54.497
Generation: 4819/5000, Time/gen: 676 ms, Est. time remaining: 00h:02m:02s:356ms Fitness - Max: 4.1453 Mean: 0.6431, Complexity - Max: 103 Mean: 99.59 Champ: 103 Strategy: ...	1/8/2018	08:19:01.265
Generation: 4829/5000, Time/gen: 1136 ms, Est. time remaining: 00h:03m:14s:256ms Fitness - Max: 4.6362 Mean: 0.5285, Complexity - Max: 103 Mean: 99.59 Champ: 103 Strategy: ...	1/8/2018	08:19:12.627
Generation: 4839/5000, Time/gen: 716 ms, Est. time remaining: 00h:03m:54s:310ms Fitness - Max: 5.0722 Mean: 0.5784, Complexity - Max: 93 Mean: 92.17 Champ: 93 Strategy: Sim...	1/8/2018	08:19:19.736
Generation: 4849/5000, Time/gen: 658 ms, Est. time remaining: 00h:03m:39s:358ms Fitness - Max: 4.4119 Mean: 0.5912, Complexity - Max: 92 Mean: 89.98 Champ: 90 Strategy: Sim...	1/8/2018	08:19:26.319
Generation: 4859/5000, Time/gen: 672 ms, Est. time remaining: 00h:03m:34s:752ms Fitness - Max: 4.5665 Mean: 0.3949, Complexity - Max: 89 Mean: 87.14 Champ: 87 Strategy: Sim...	1/8/2018	08:19:33.042
Generation: 4869/5000, Time/gen: 661 ms, Est. time remaining: 00h:03m:26s:591ms Fitness - Max: 4.3348 Mean: 0.4482, Complexity - Max: 89 Mean: 85.89 Champ: 85 Strategy: Sim...	1/8/2018	08:19:39.656
Generation: 4879/5000, Time/gen: 672 ms, Est. time remaining: 00h:03m:12s:32ms Fitness - Max: 4.3044 Mean: 0.5053, Complexity - Max: 87 Mean: 84.66 Champ: 78 Strategy: Sim...	1/8/2018	08:19:46.384
Generation: 4889/5000, Time/gen: 678 ms, Est. time remaining: 00h:03m:15s:289ms Fitness - Max: 4.2528 Mean: 0.3227, Complexity - Max: 85 Mean: 78.68 Champ: 73 Strategy: Sim...	1/8/2018	08:19:53.173
Generation: 4899/5000, Time/gen: 650 ms, Est. time remaining: 00h:03m:05s:650ms Fitness - Max: 4.5200 Mean: 0.2909, Complexity - Max: 79 Mean: 70.39 Champ: 71 Strategy: Sim...	1/8/2018	08:19:59.681
Generation: 4909/5000, Time/gen: 673 ms, Est. time remaining: 00h:03m:01s:143ms Fitness - Max: 4.2046 Mean: 0.1588, Complexity - Max: 74 Mean: 66.12 Champ: 70 Strategy: Sim...	1/8/2018	08:20:06.419
Generation: 4919/5000, Time/gen: 637 ms, Est. time remaining: 00h:00m:54s:513ms Fitness - Max: 2.2081 Mean: 0.1180, Complexity - Max: 70 Mean: 61.08 Champ: 61 Strategy: Sim...	1/8/2018	08:20:13.155
Generation: 4929/5000, Time/gen: 637 ms, Est. time remaining: 00h:00m:45s:227ms Fitness - Max: 2.4500 Mean: 0.0290, Complexity - Max: 58 Mean: 56.24 Champ: 54 Strategy: Sim...	1/8/2018	08:20:19.534
Generation: 4939/5000, Time/gen: 618 ms, Est. time remaining: 00h:00m:37s:698ms Fitness - Max: 2.4339 Mean: 0.1098, Complexity - Max: 55 Mean: 53.44 Champ: 54 Strategy: Sim...	1/8/2018	08:20:25.717

Details
 Generation: 128/5000, Time/gen: 580 ms, Est. time remaining: 00h:47m:05s:760ms Fitness - Max: 6.1410 Mean: 1.0057, Complexity - Max: 136 Mean: 127.99
 Champ: 129 Strategy: Complexifying, Specie size - Max: 141 Min: 1, Generations since last improvement: 119

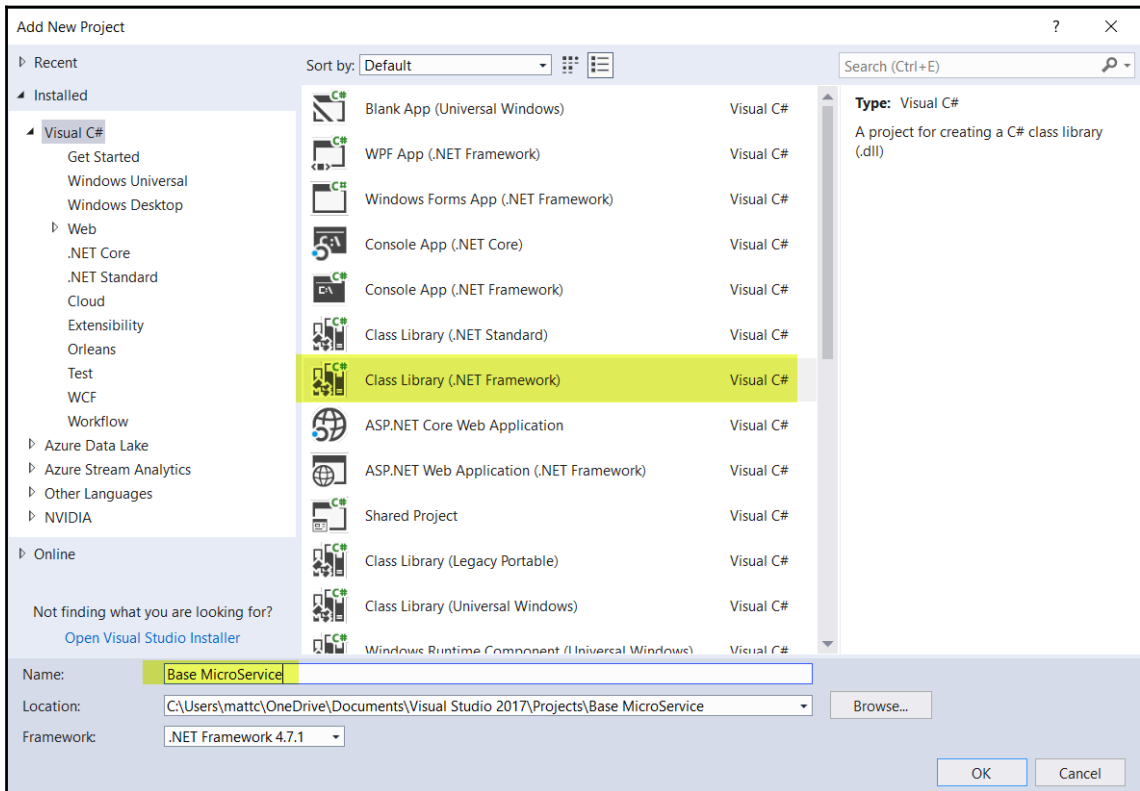
Watches

Label	Value
Complexity - Mean	132.09
Champ	128
Strategy	Complexifying
Specie size - Max	116
Specie size - Min	1
Generations since last improvement	129
Obj Objective Score	0.5661
SpeciesSize0	1
SpeciesSize1	3
SpeciesSize2	218
SpeciesSize3	63
SpeciesSize4	4
SpeciesSize5	5
SpeciesSize6	3
SpeciesSize7	1
SpeciesSize8	1
SpeciesSize9	1
SpeciesMeanFitness0	4.3644
SpeciesMeanFitness1	4.8557
SpeciesMeanFitness2	0.5208
SpeciesMeanFitness3	1.4864
SpeciesMeanFitness4	3.8996
SpeciesMeanFitness5	3.8416
SpeciesMeanFitness6	4.3695
SpeciesMeanFitness7	5.4745
SpeciesMeanFitness8	4.1663
SpeciesMeanFitness9	5.0560
SpeciesMeanChamp0	130.0000
SpeciesMeanChamp1	124.0000
SpeciesMeanChamp2	120.6881
SpeciesMeanChamp3	134.3175
SpeciesMeanChamp4	128.7500
SpeciesMeanChamp5	128.0000
SpeciesMeanChamp6	138.0000
SpeciesMeanChamp7	124.0000
SpeciesMeanChamp8	124.0000
SpeciesMeanChamp9	124.0000





Chapter 3: Creating a Base Microservice and Interface



The screenshot shows the NuGet Package Manager interface for MicroServiceManager. The search results list several packages by MichaConrad, all at version v1.1.2. The selected package, CacheManager.SystemRuntimeCaching, is highlighted in blue. The right-hand pane displays the details for this package, including its version (Latest stable 1.1.2), an 'Install' button, and a description of its functionality as a local in-memory cache layer extension.

Package Name	Author	Downloads	Version
CacheManager.Core	MichaConrad	353K	v1.1.2
CacheManager.SystemRuntimeCaching	MichaConrad	201K	v1.1.2
CacheManager.StackExchange.Redis	MichaConrad	159K	v1.1.2
CacheManager.Microsoft.Extensions.Configuration	MichaConrad	40K	v1.1.2
CacheManager.Serialization.Json	MichaConrad	91.4K	v1.1.2

CacheManager.SystemRuntimeCaching by MichaConrad, 201K downloads v1.1.2

CacheManager extension package which adds System.Runtime.Caching.MemoryCache as an option for a local in-memory cache layer. CacheManager is an open source caching abstraction layer for .NET w...

Version: Latest stable 1.1.2 **Install**

Options

Description

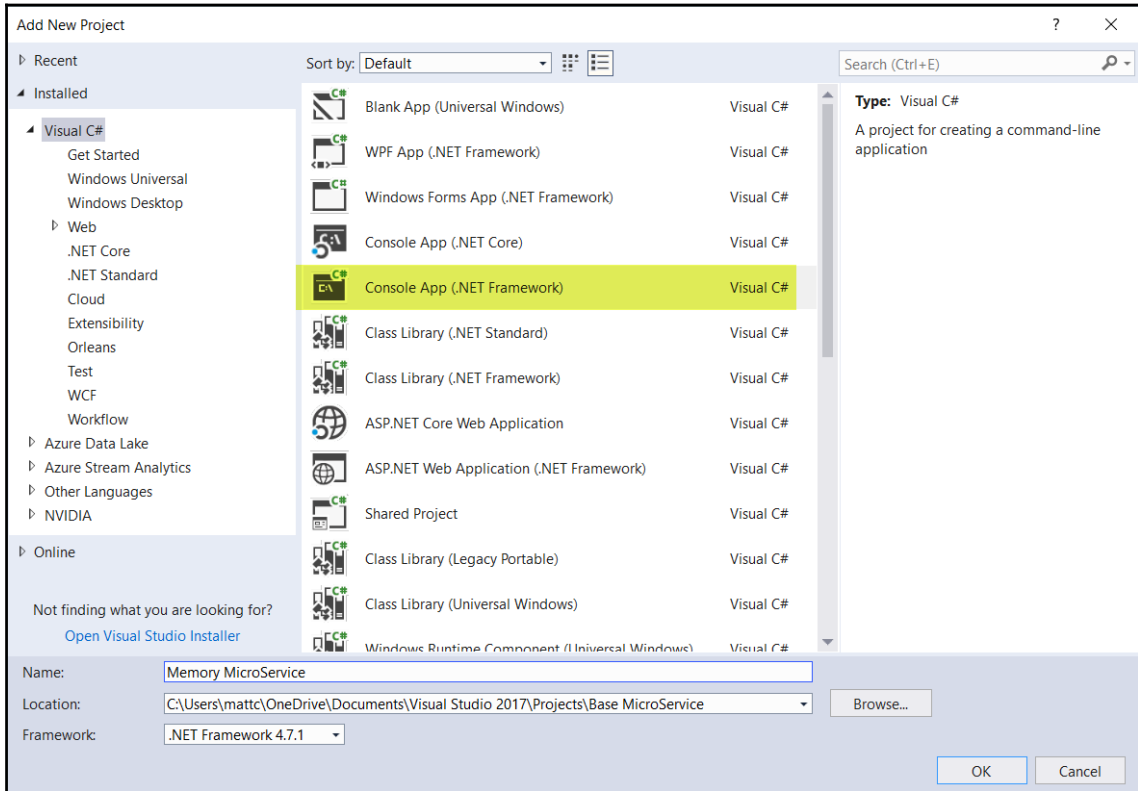
CacheManager extension package which adds System.Runtime.Caching.MemoryCache as an option for a local in-memory cache layer. CacheManager is an open source caching abstraction layer for .NET written in C#. It supports various cache providers and implements many advanced features.

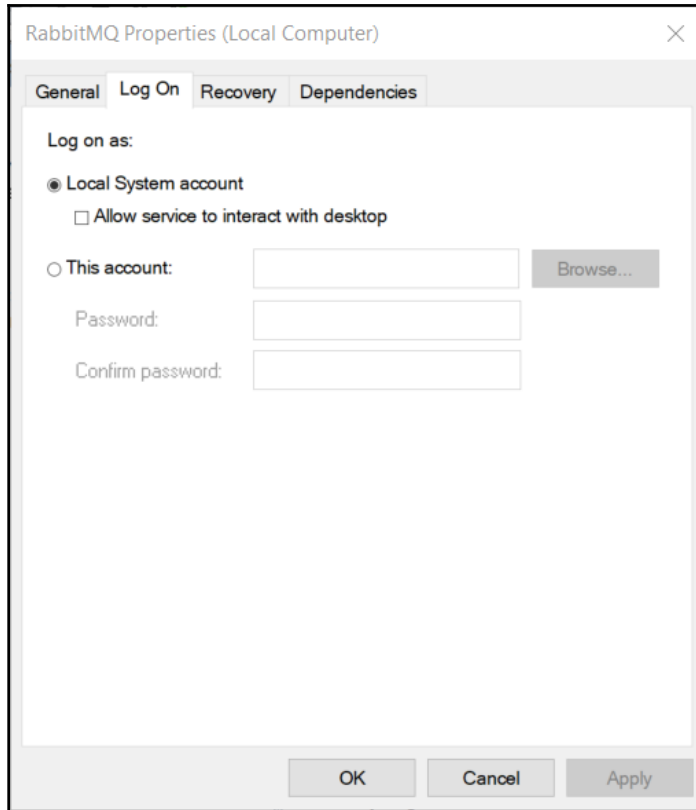
Version: 1.1.2

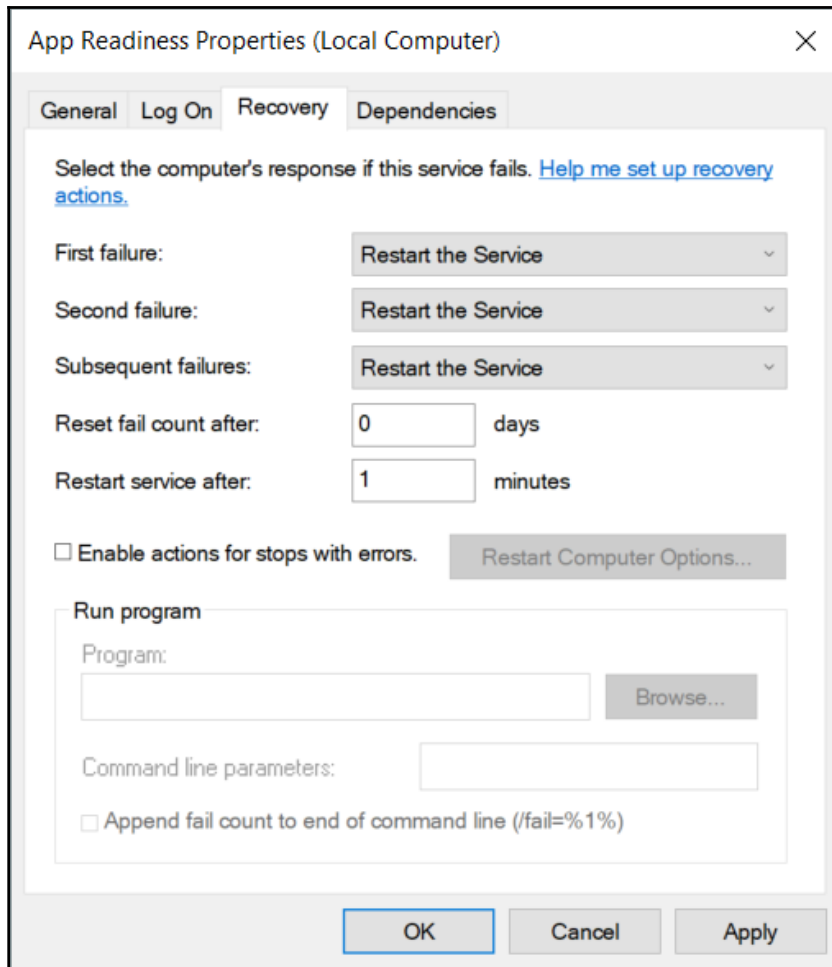
Author(s): MichaConrad

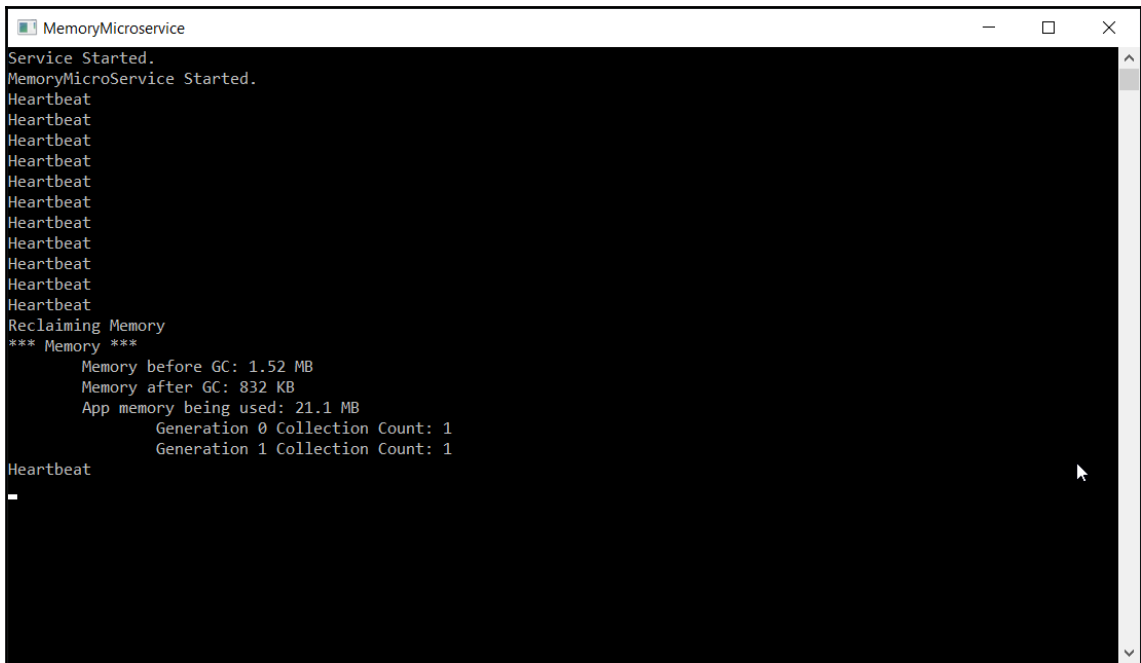
License: <https://github.com/MichaCo/CacheManager/blob/master/LICENSE>

Chapter 4: Designing a Memory Management Microservice





















```
MemoryMicroservice
Service Started.
MemoryMicroService Started.
Heartbeat
Heartbeat
Heartbeat
Heartbeat
Heartbeat
Heartbeat
Heartbeat
Heartbeat
Heartbeat
Heartbeat
Heartbeat
Reclaiming Memory
*** Memory ***
    Memory before GC: 1.52 MB
    Memory after GC: 832 KB
    App memory being used: 21.1 MB
        Generation 0 Collection Count: 1
        Generation 1 Collection Count: 1
Heartbeat
-
```

Exchanges

▼ All exchanges (9)


Pagination 


Page of 1 - Filter: Regex 

Name	Type	Features	Message rate in	Message rate out	+/-
(AMQP default)	direct				
Deployments	fanout		0.00/s	0.00/s	
EvolvedAI	fanout				
amq.direct	direct				
amq.fanout	fanout				
amq.headers	headers				
amq.match	headers				
amq.rabbitmq.trace	topic	 			
amq.topic	topic				

Exchange: EvolvedAI

▼ Overview

Message rates 

Currently idle 

Details

Type fanout


Features durable: true

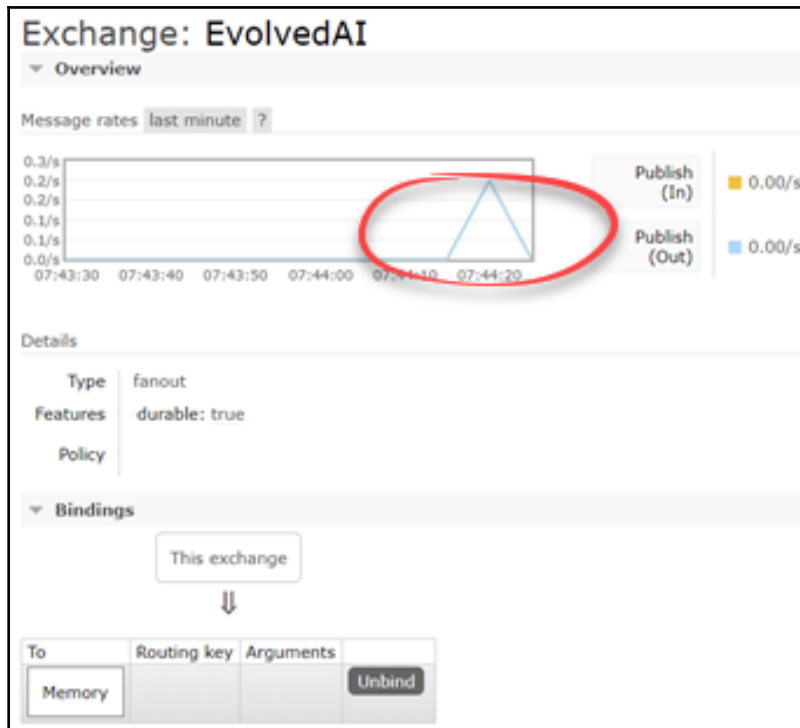
Policy

▼ Bindings

This exchange

↓

To	Routing key	Arguments	
Memory			



Overview			Messages			Message rates		
Name	Features	State	Ready	Unacked	Total	incoming	deliver / get	ack
Deployments	D	idle	5	0	5	0.00/s		
HealthMonitor	D	idle	0	0	0			
JobScheduler	D	idle	0	0	0			
Memory	D	idle	0	0	0			

Exchange: EvolvedAI

▼ Overview

Message rates **last minute** ?

0.3/s
0.2/s
0.2/s
0.1/s
0.1/s
0.0/s

07:43:30 07:43:40 07:43:50 07:44:00 07:44:10 07:44:20

Publish (In) 0.00/s

Publish (Out) 0.00/s

Details

Type fanout

Features durable: true

Policy

▼ Bindings

This exchange

⇓

To	Routing key	Arguments	
Memory			Unbind



MemoryMicroservice

```

heartbeat
heartbeat
heartbeat
heartbeat
heartbeat
heartbeat
heartbeat
heartbeat
heartbeat
heartbeat
Reclaiming Memory
*** Memory ***
Memory before GC: 1.67 MB
Memory after GC: 1.44 MB
App memory being used: 37.6 MB
Generation 0 Collection Count: 4
Generation 1 Collection Count: 4
Time Spent in GC: 00%
*** Memory ***
heartbeat
heartbeat
heartbeat
heartbeat
heartbeat
heartbeat
heartbeat
heartbeat
heartbeat

```

RabbitMQ 3.7.4 Erlang 20.3

Overview Connections Channels Exchanges **Queues** Admin

Queue Memory Overview

Queued messages *last minute* ?

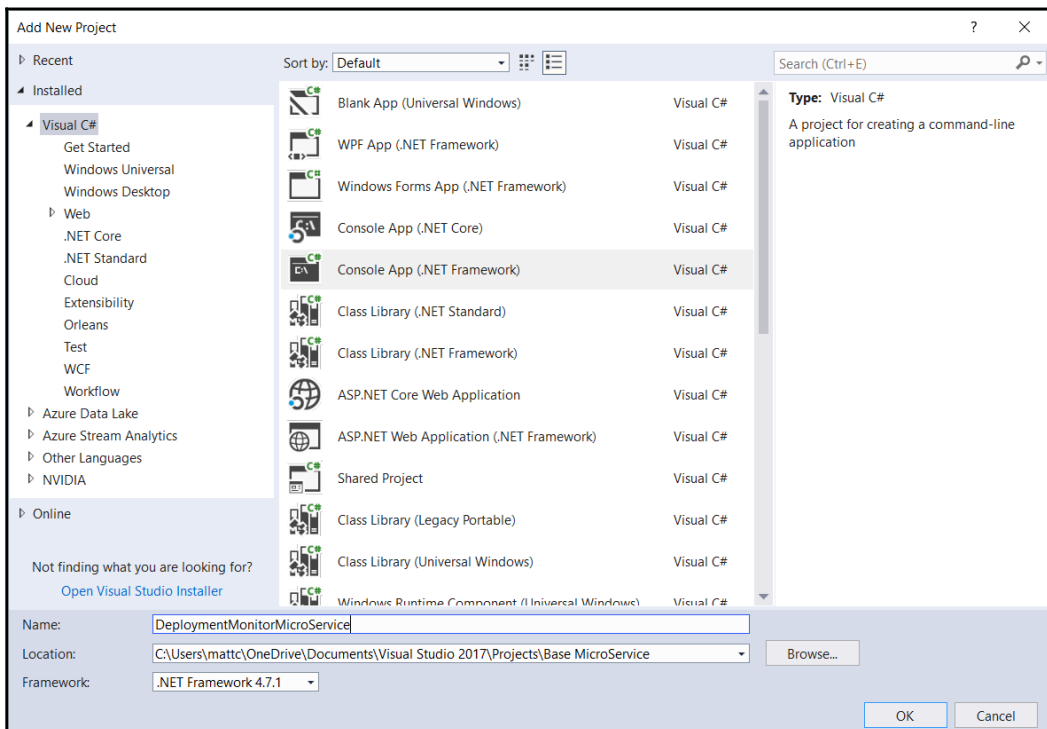
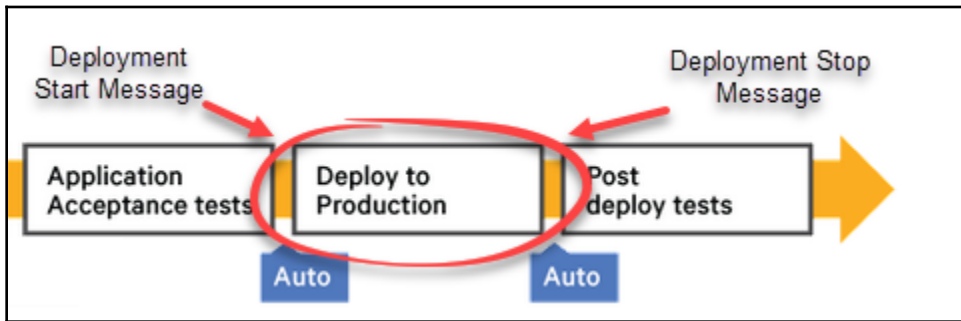
Message rates *last minute* ?

Ready: 3, Unacked: 0, Total: 3

Publish: 0.00/s

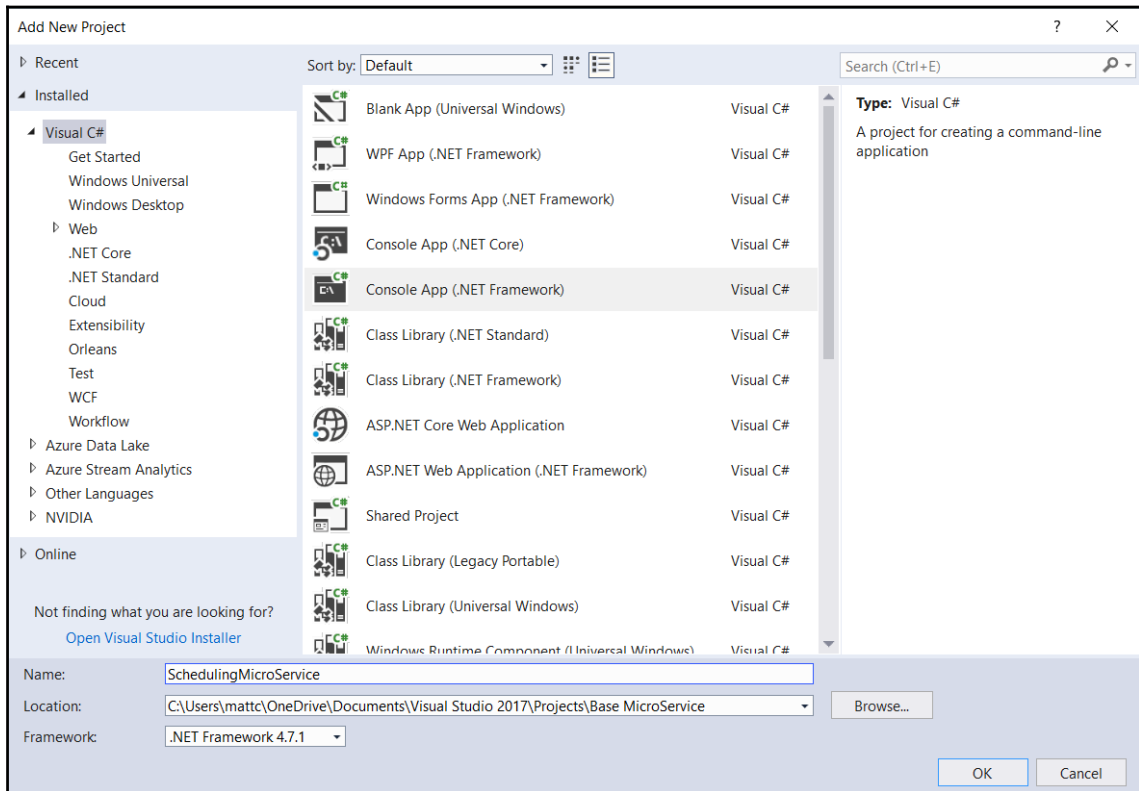
These can be changed

Chapter 5: Designing a Deployment Monitor Microservice





Chapter 6: Designing a Scheduling Microservice



The screenshot shows a package manager interface. On the left, a list of installed packages is displayed:

- Quartz** by Marko Lahma (Quartz Scheduling Framework for .NET) - v3.0.0 (highlighted), v3.0.5
- RabbitMQ.Client** by RabbitMQ.Client - v5.0.1
- ReflectSoftware.Insight** by ReflectSoftware Inc. - v5.7.1.1
- Serilog** by Serilog Contributors - v2.6.0, v2.7.1
- Serilog.Enrichers.Environment** by Serilog Contributors - v2.1.2
- Serilog.Enrichers.Thread** by Serilog Contributors - v3.0.0

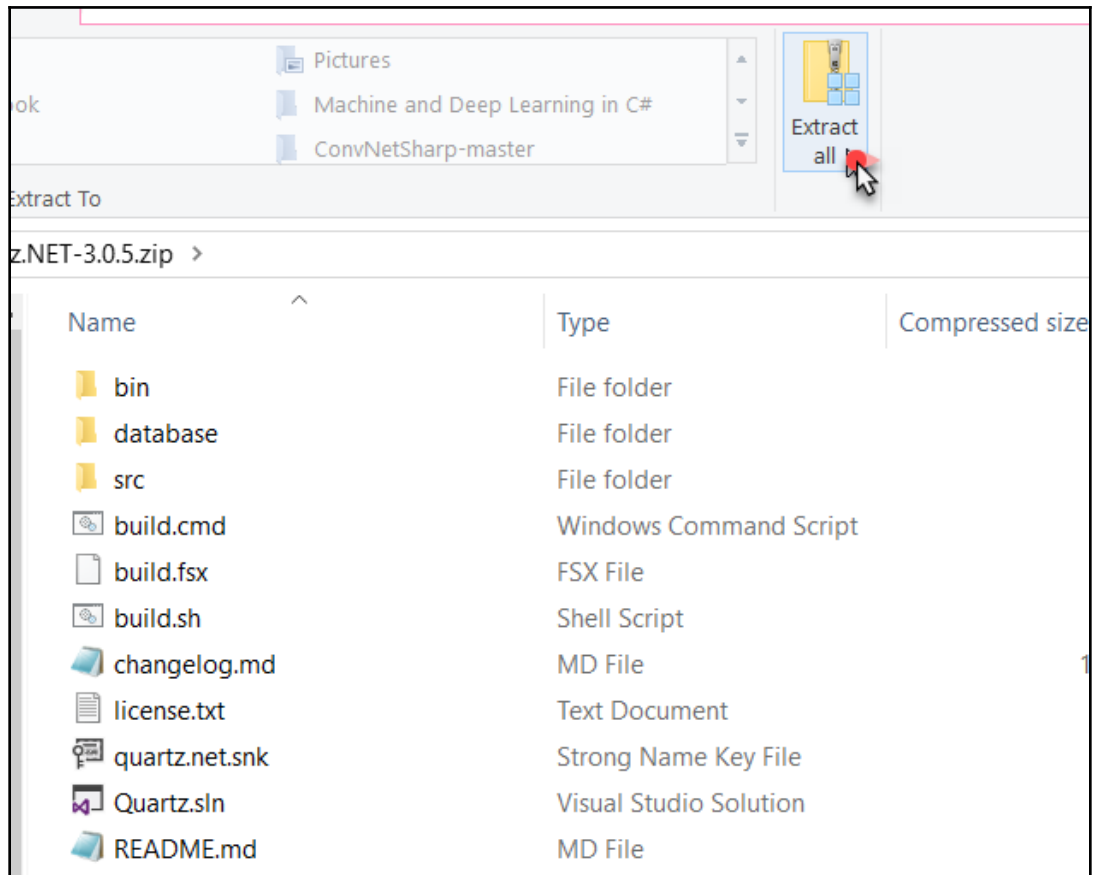
On the right, the details for the **Quartz** package are shown:

- Installed:** 3.0.0 (Uninstall)
- Version:** Latest stable 3.0.5 (Update)
- Description:** Quartz Scheduling Framework for .NET
- Version:** 3.0.5
- Author(s):** Marko Lahma
- License:** <http://www.apache.org/licenses/LICENSE-2.0>
- Date published:** Sunday, May 27, 2018 (5/27/2018)
- Project URL:** <https://www.quartz-scheduler.net/>
- Report Abuse:** <https://www.nuget.org/packages/Quartz/3.0.5/ReportAbuse>
- Tags:** scheduling, scheduler, jobs, triggers, tasks.

The screenshot shows the GitHub repository page for **quartznet / quartznet**. The page is viewed from the **Releases** tab. The current release is **Quartz.NET 3.0.5**, which is the latest release. It was released 10 days ago by **lahma** and includes 2 commits to master since this release.

The **Assets** section lists the following files:

- Quartz.NET-3.0.5.zip** (highlighted)
- Source code (zip)**
- Source code (tar.gz)**



```

Administrator: Command Prompt

C:\Tools\Quartz.NET-3.0.5\bin\Release\Quartz.Server\net452>quartz.server.exe install
Configuration Result:
[Success] Name QuartzServer
[Success] DisplayName Quartz Server
[Success] Description Quartz Job Scheduling Server
[Success] ServiceName QuartzServer
Topshefl v4.0.0.0, .NET Framework v4.0.30319.42000

Running a transacted installation.

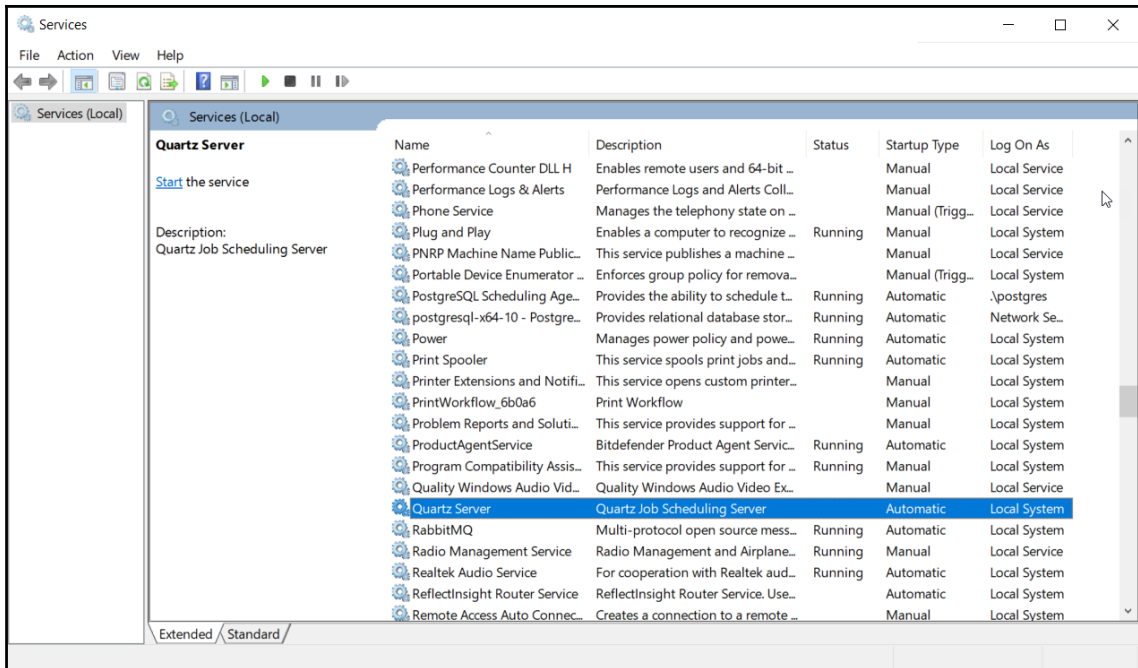
Beginning the Install phase of the installation.
Installing Quartz Server service
Installing service QuartzServer...
Service QuartzServer has been successfully installed.

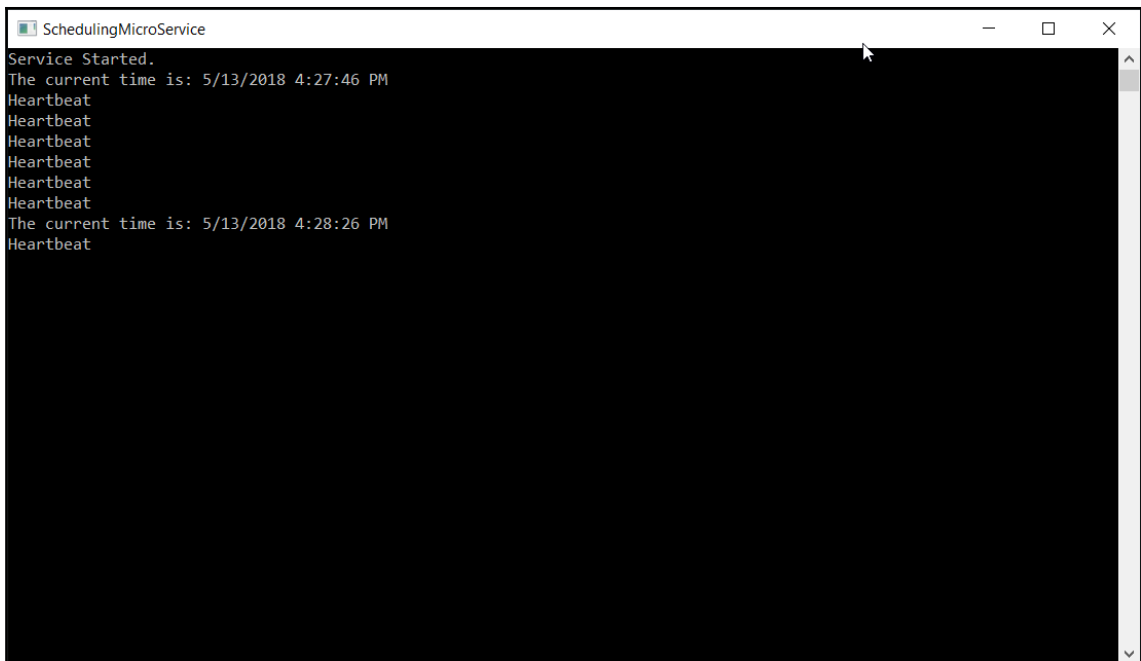
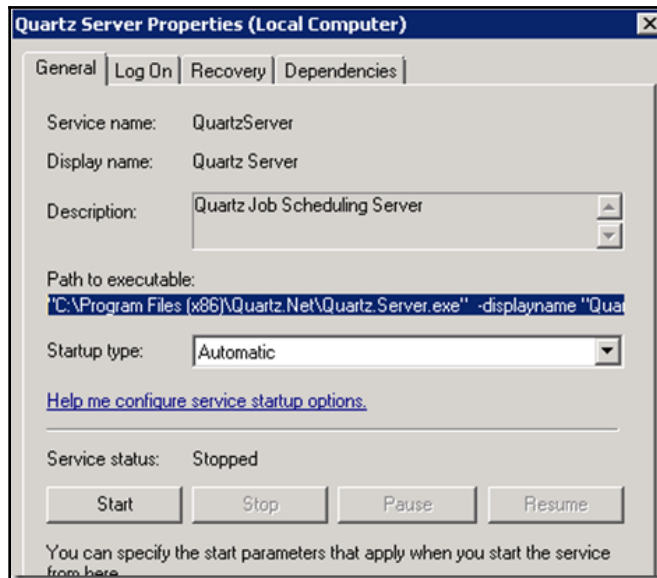
The Install phase completed successfully, and the Commit phase is beginning.

The Commit phase completed successfully.

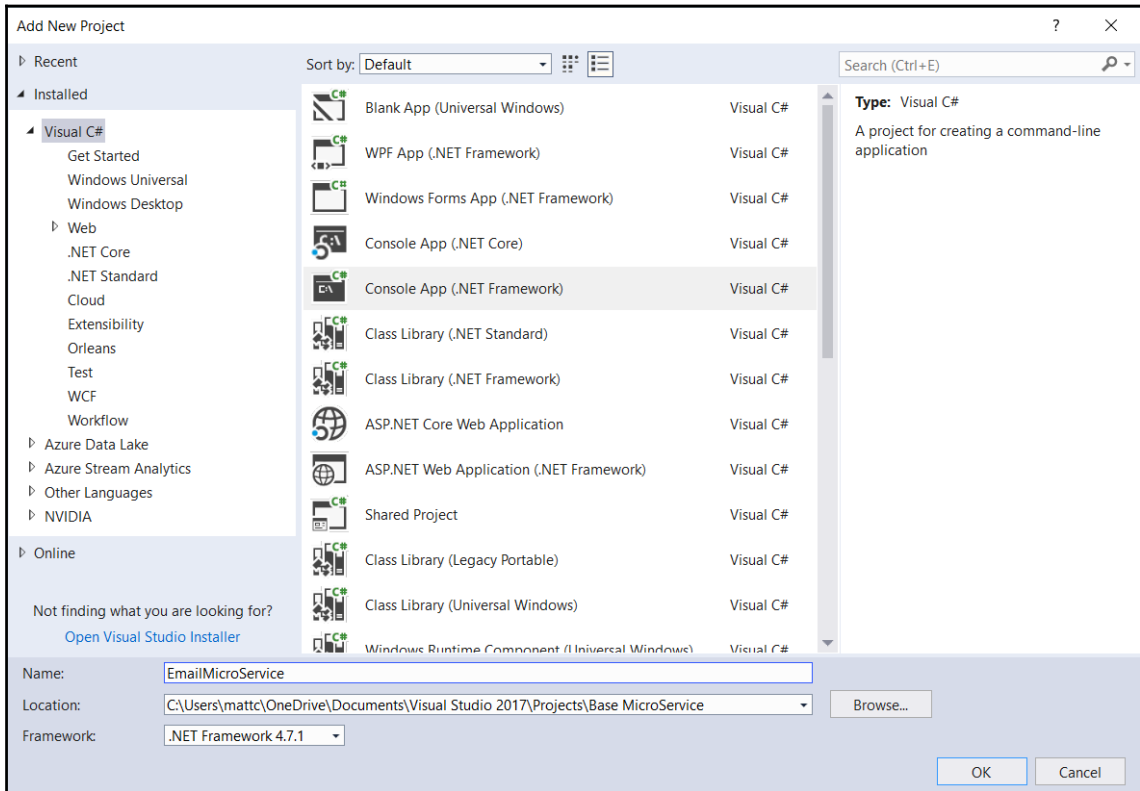
The transacted install has completed.

C:\Tools\Quartz.NET-3.0.5\bin\Release\Quartz.Server\net452>_
    
```





Chapter 7: Designing an Email Microservice



Chapter 8: Designing a File Monitoring Microservice

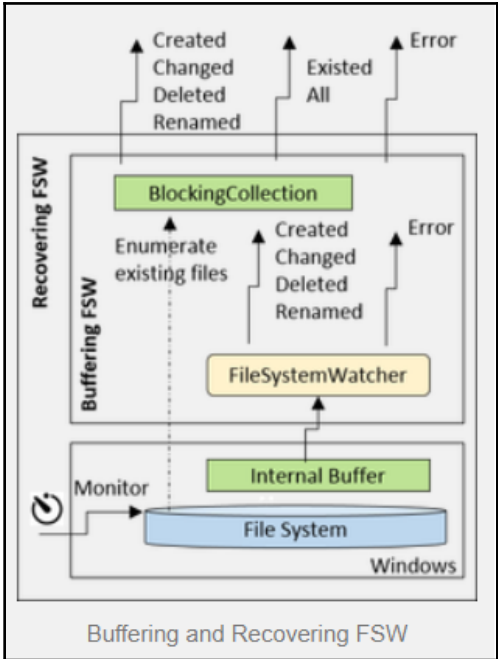
```
Created: New Microsoft Excel Worksheet.xlsx
Changed: New Microsoft Excel Worksheet.xlsx
Changed: New Microsoft Excel Worksheet.xlsx
Created: ~ew Microsoft Excel Worksheet.tmp
Changed: ~ew Microsoft Excel Worksheet.tmp
Changed: ~ew Microsoft Excel Worksheet.tmp
Changed: ~ew Microsoft Excel Worksheet.tmp
Changed: ~ew Microsoft Excel Worksheet.tmp
Changed: ~ew Microsoft Excel Worksheet.tmp
Created: New Microsoft Excel Worksheet.xlsx~RF436f7c2.TMP
Deleted: New Microsoft Excel Worksheet.xlsx
Changed: New Microsoft Excel Worksheet.xlsx~RF436f7c2.TMP
Renamed: New Microsoft Excel Worksheet.xlsx
Deleted: New Microsoft Excel Worksheet.xlsx~RF436f7c2.TMP

Renamed: test.xlsx                               Rename

Created: ~$test.xlsx
Changed: ~$test.xlsx                             Open

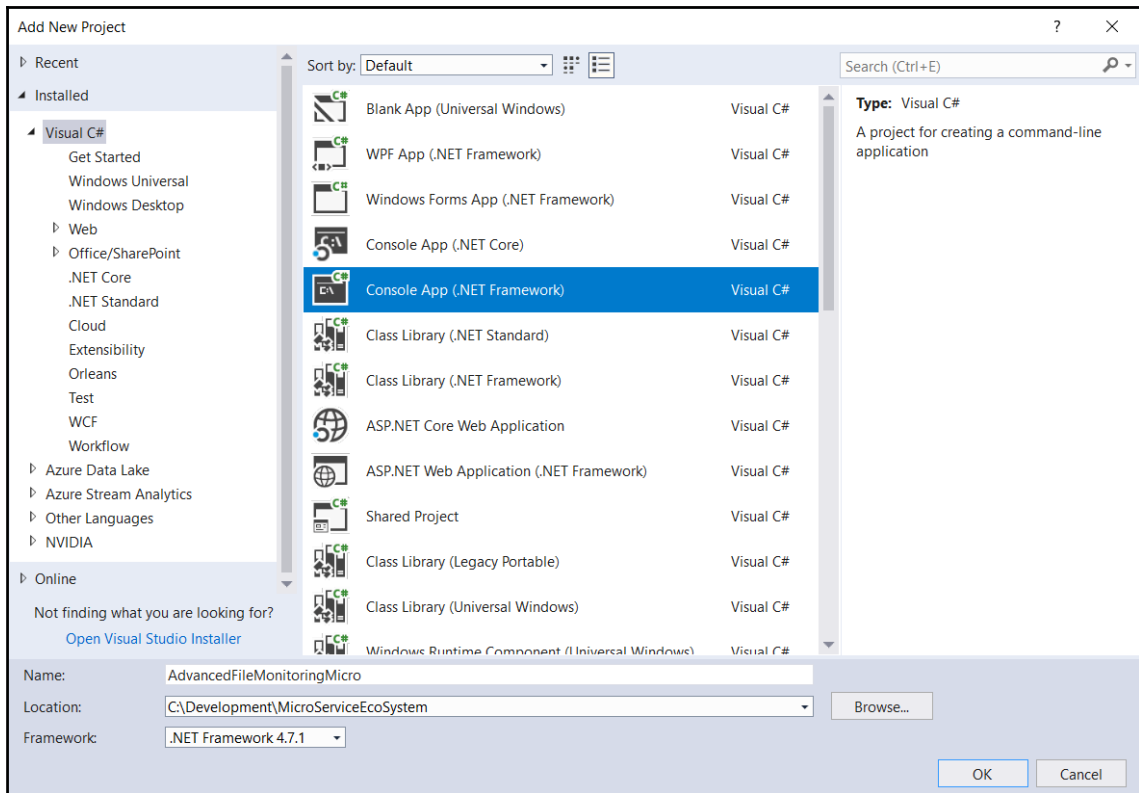
Created: DF473400
Changed: DF473400
Changed: DF473400
Changed: DF473400
Changed: DF473400
Renamed: E7B3C637.tmp
Renamed: test.xlsx
Deleted: E7B3C637.tmp

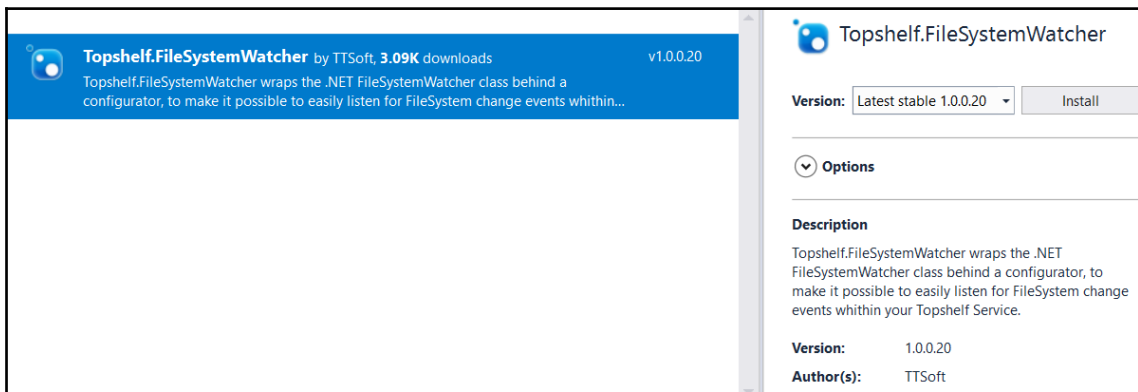
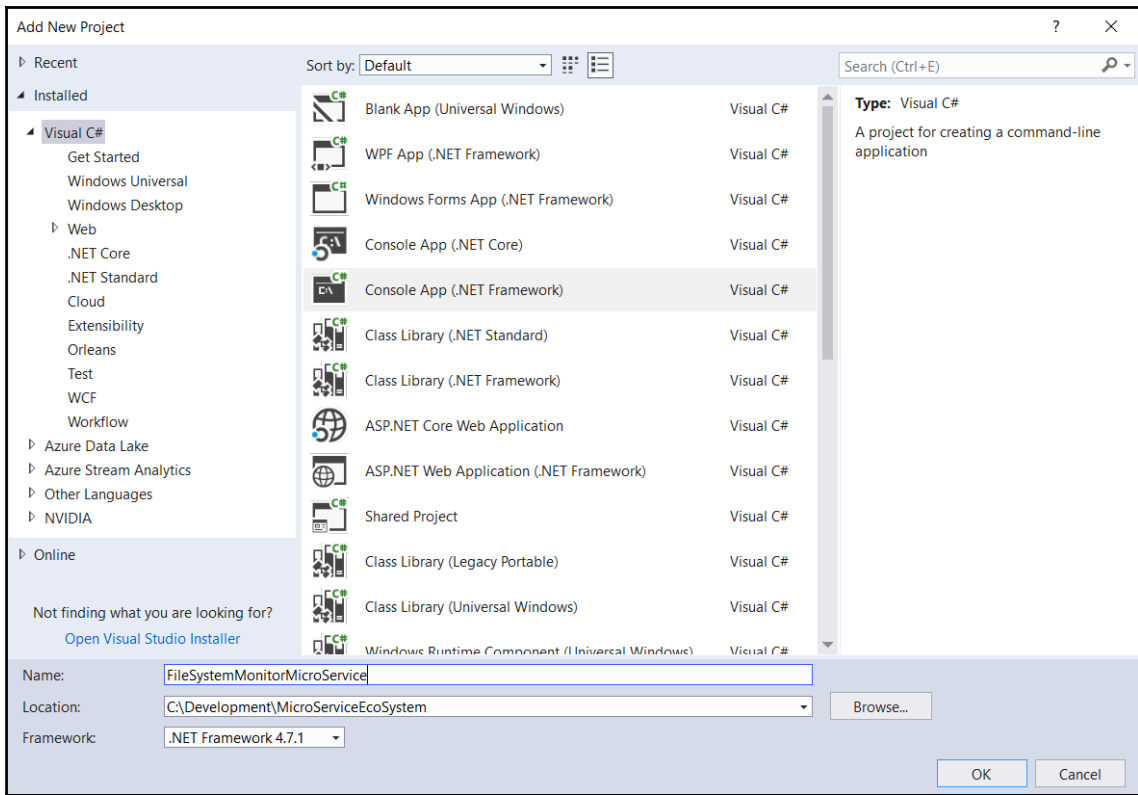
Deleted: ~$test.xlsx                             Close
```

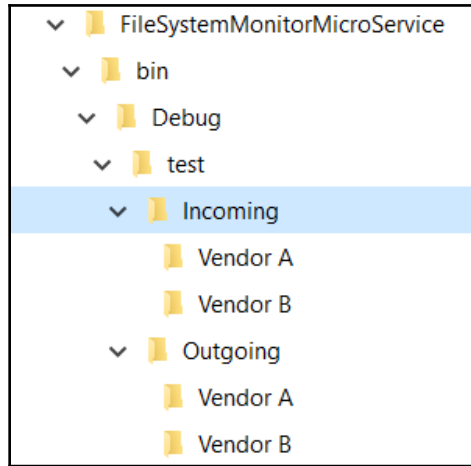



```
48:56,387| Start: Will auto-detect unavailability of watched directory.
- Windows timeout accessing network shares: ~110 sec on start,
~45 sec while watching.
48:56,408| _monitorTimer_Elapsed: Watching:\\gogo\test\in
? Processing... |Press <Enter> to continue.
48:56,476| _monitorTimer_Elapsed: Directory \\gogo\test\in accessibility is OK.
48:56,480| ProcessFile: 04.05.2015 09:48:56 -Polled- \\gogo\test\in\Test-1.xml
49:06,223| ProcessFile: 04.05.2015 09:49:06 -Created- \\gogo\test\in\Test-2.xml
49:46,501| _fileWatcher_Error: The specified network name is no longer available
49:46,503| _fileWatcher_Error: Will try to recover automatically!
49:51,506| _monitorTimer_Elapsed: Watching:\\gogo\test\in
51:00,036| _monitorTimer_Elapsed: => Directory \\gogo\test\in Is Not accessible.
- Will try to recover automatically in 00:00:05!
51:05,038| _monitorTimer_Elapsed: Watching:\\gogo\test\in
51:05,052| _monitorTimer_Elapsed: ...retrying
51:10,055| _monitorTimer_Elapsed: Watching:\\gogo\test\in
51:10,078| _monitorTimer_Elapsed: ...retrying
51:15,080| _monitorTimer_Elapsed: Watching:\\gogo\test\in
51:15,094| _monitorTimer_Elapsed: ...retrying
51:20,096| _monitorTimer_Elapsed: Watching:\\gogo\test\in
51:20,109| _monitorTimer_Elapsed: ...retrying
51:25,110| _monitorTimer_Elapsed: Watching:\\gogo\test\in
51:25,123| _monitorTimer_Elapsed: ...retrying
51:30,125| _monitorTimer_Elapsed: Watching:\\gogo\test\in
51:30,178| _monitorTimer_Elapsed: Directory \\gogo\test\in accessibility is OK.
51:30,183| ProcessFile: 04.05.2015 09:51:30 -Polled- \\gogo\test\in\Test-3.xml
51:30,183| _monitorTimer_Elapsed: <= Watcher recovered
51:37,231| ProcessFile: 04.05.2015 09:51:37 -Created- \\gogo\test\in\Test-4.xml
51:42,672| _Lambda$__22-0: Obeying cancel request
Stopping...
? Stopped. |Press <Enter> to continue.
```

RecoveringFileSystemWatcher working and auto recovering



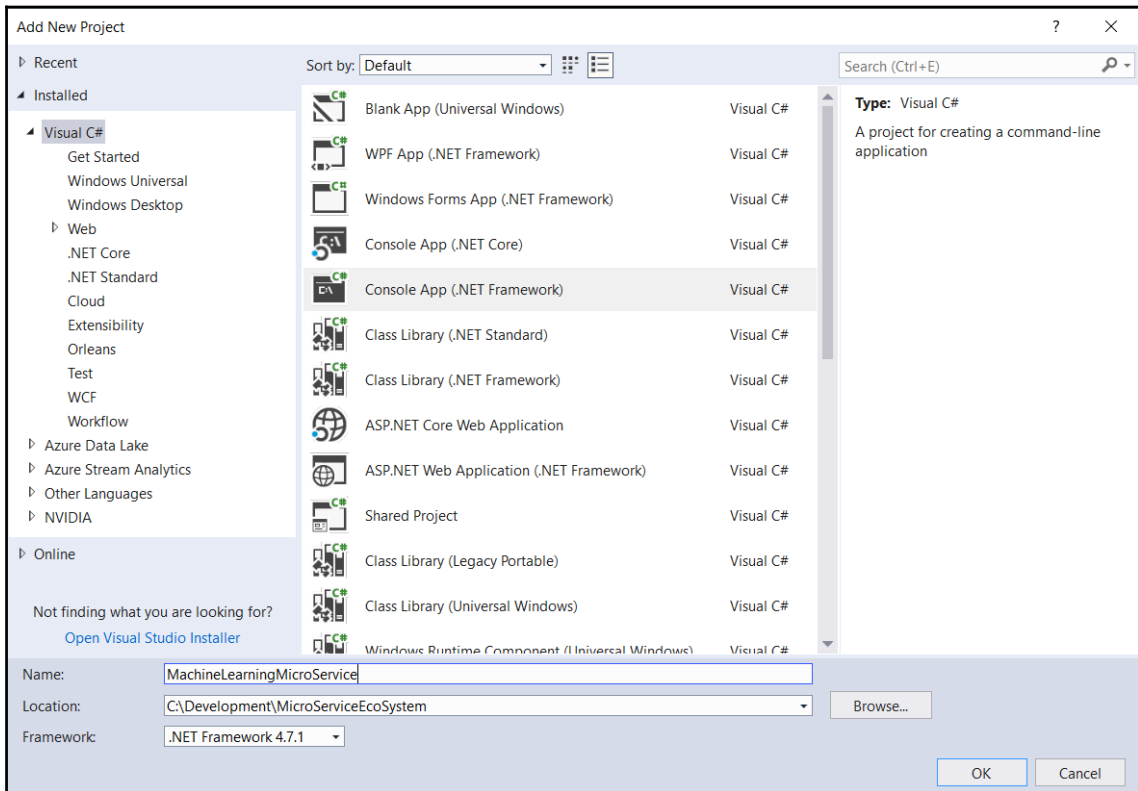


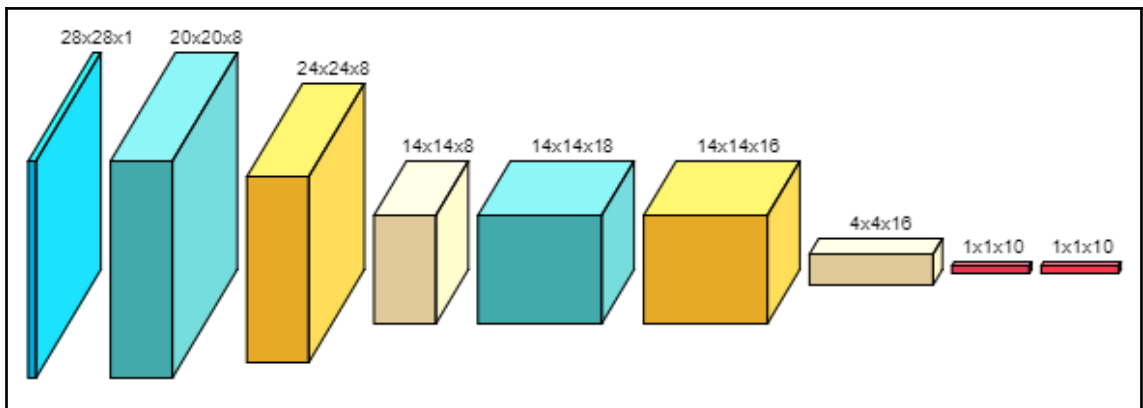
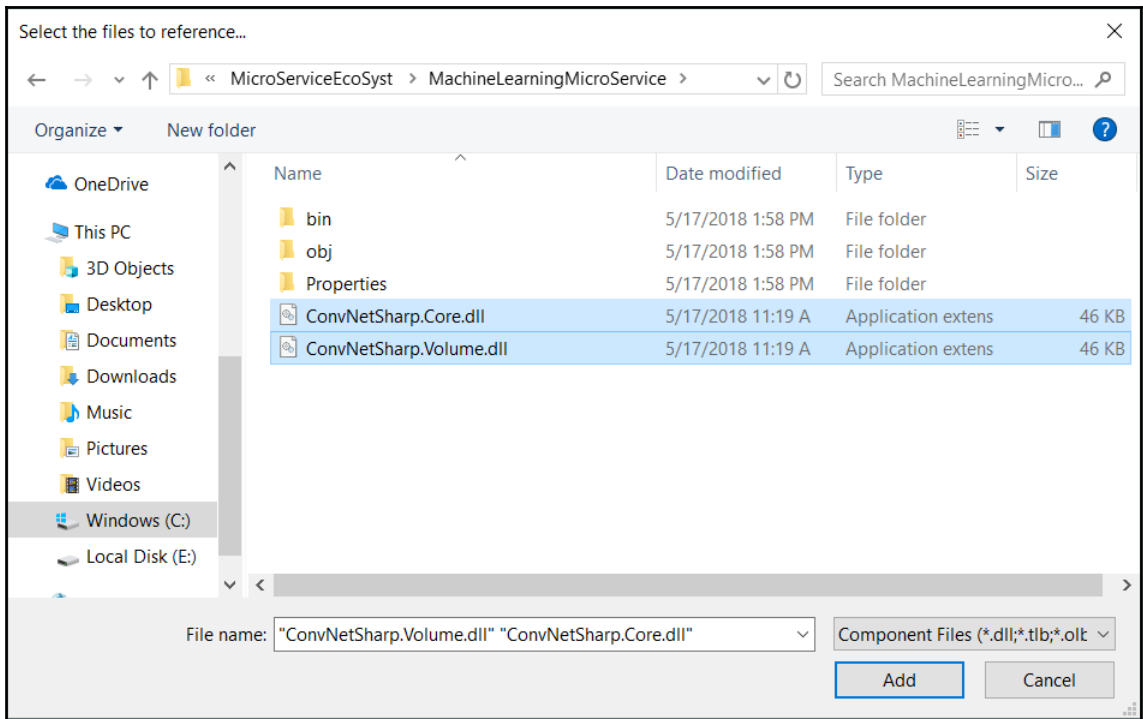


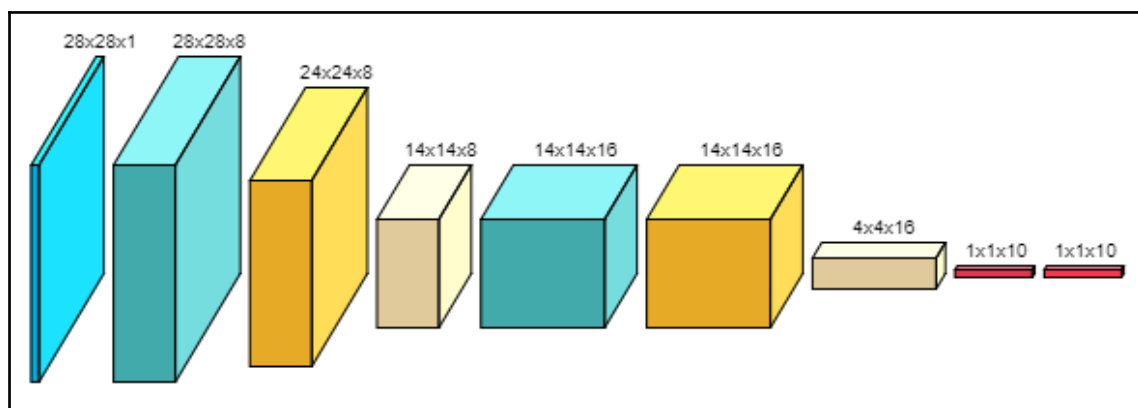
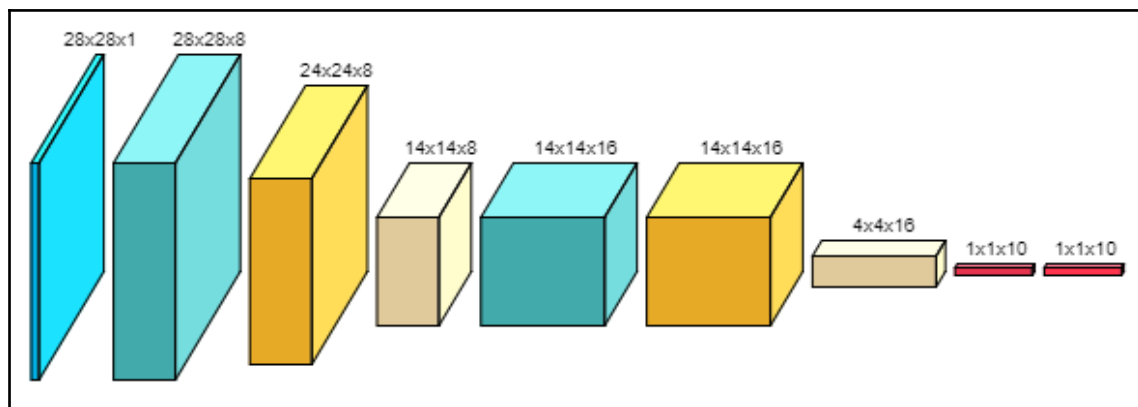
```
FileSystemMonitorMicroService
Configuration Result:
[Success] Name FileSystemMonitorMicroService
[Success] ServiceName FileSystemMonitorMicroService
Topshelf v4.0.0.0, .NET Framework v4.0.30319.42000
[Topshelf.FileSystemWatcher] configured to listen for events in C:\Development\MicroServiceEcoSystem\FileSystemMonitorMicroService\bin\Debug\test\
[Topshelf.FileSystemWatcher] configured to listen for events in C:\Development\MicroServiceEcoSystem\FileSystemMonitorMicroService\bin\Debug\test\
[Topshelf.FileSystemWatcher] configured to listen for events in C:\Development\MicroServiceEcoSystem\FileSystemMonitorMicroService\bin\Debug\test\
[Topshelf.FileSystemWatcher] configured to listen for events in C:\Development\MicroServiceEcoSystem\FileSystemMonitorMicroService\bin\Debug\test\
[Topshelf.FileSystemWatcher] configured to listen for events in C:\Development\MicroServiceEcoSystem\FileSystemMonitorMicroService\bin\Debug\test\
The FileSystemMonitorMicroService service is now running, press Control+C to exit.
*****
ChangeType = Created
FullPath = C:\Development\MicroServiceEcoSystem\FileSystemMonitorMicroService\bin\Debug\test\JetBrains.Annotations.xml
Name = JetBrains.Annotations.xml
FileSystemEventType Normal
*****
ChangeType = Changed
FullPath = C:\Development\MicroServiceEcoSystem\FileSystemMonitorMicroService\bin\Debug\test\JetBrains.Annotations.xml
Name = JetBrains.Annotations.xml
FileSystemEventType Normal
*****
```

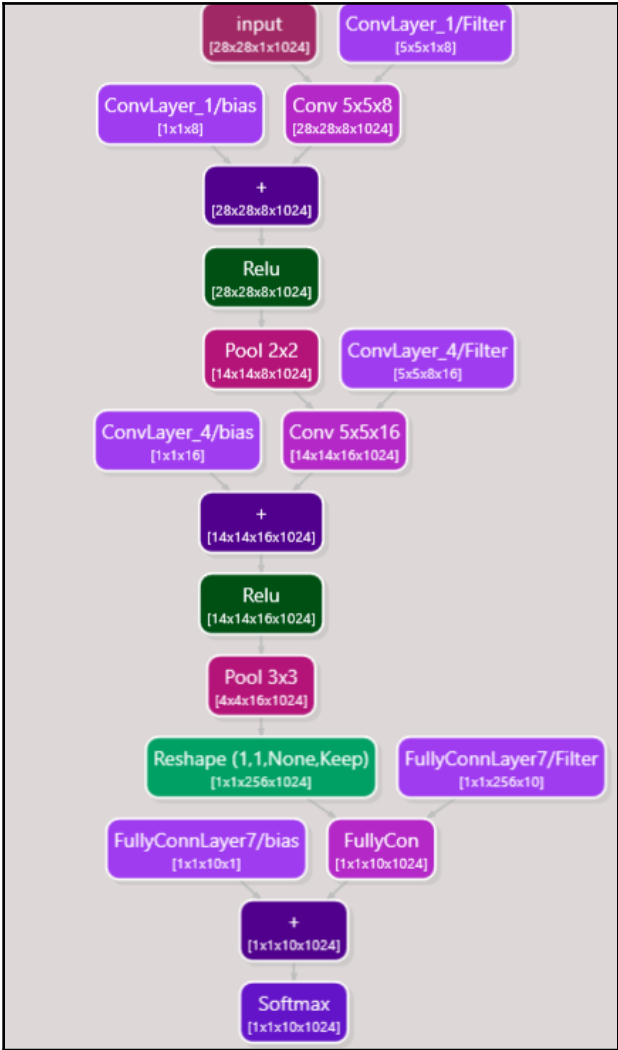
```
MicroServiceManager
Memory Used: 52.0 MB
*** Memory at ***Saturday, June 2, 2018 8:34:26 AM
    Memory before GC: 5.38 MB
CPU Used: 24.0450344085693
    Memory after GC: 2.42 MB
    App memory being used: 52.0 MB
        Generation 0 Collection Count: 7
        Generation 1 Collection Count: 5
Message: OK
    Time Spent in GC: 00.01%
*** Memory ***
Received Memory Update Message
Heartbeat
Received Health Status Message
Service: Microservice Manager_EVOLVEDAI
Status: 1
Microservice Manager_EVOLVEDAI Reclaiming Memory
Memory Used: 51.9 MB
*** Memory at ***Saturday, June 2, 2018 8:35:26 AM
    Memory before GC: 3.35 MB
CPU Used: 7.50879335403442
    Memory after GC: 2.43 MB
    App memory being used: 51.9 MB
        Generation 0 Collection Count: 9
        Generation 1 Collection Count: 7
Message: OK
    Time Spent in GC: 03.52%
*** Memory ***
Received Memory Update Message
```

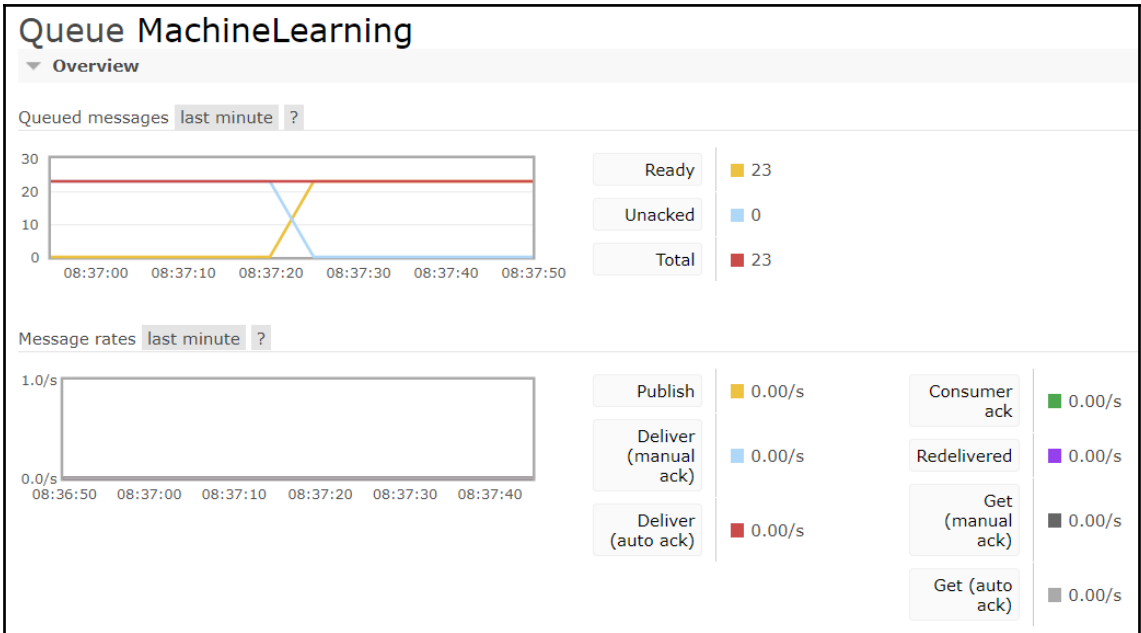
Chapter 9: Creating a Machine Learning Microservice



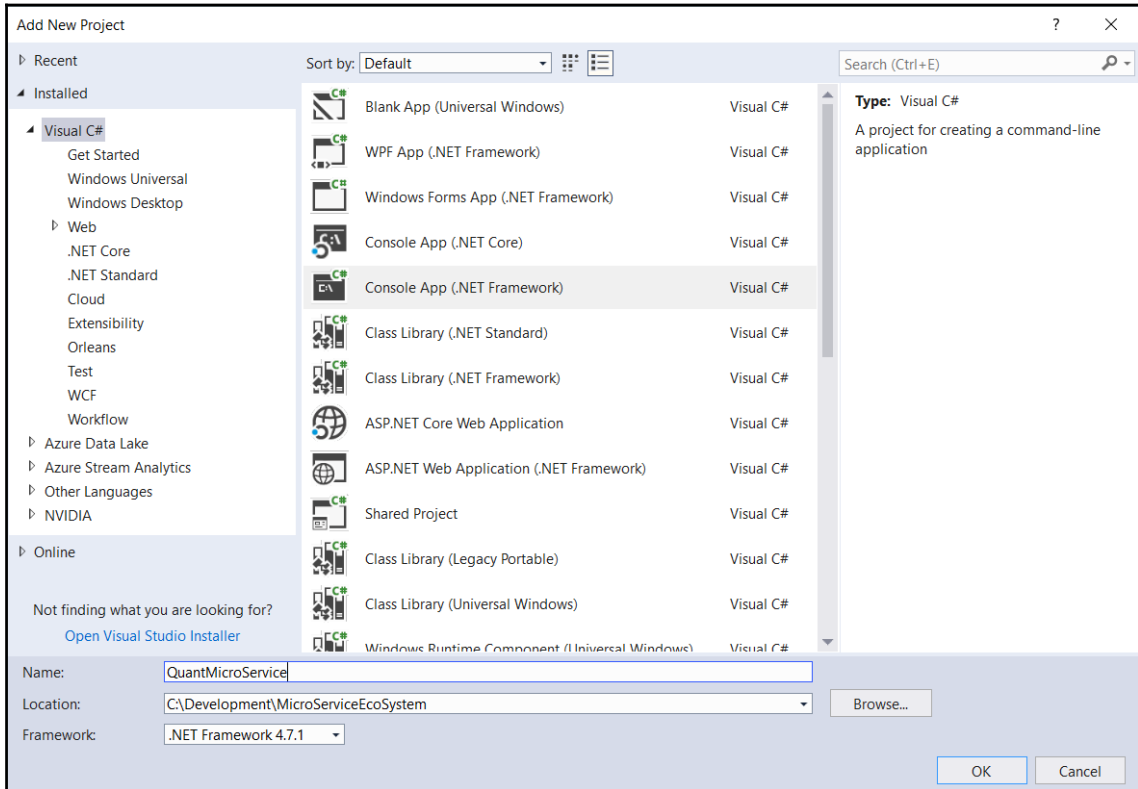


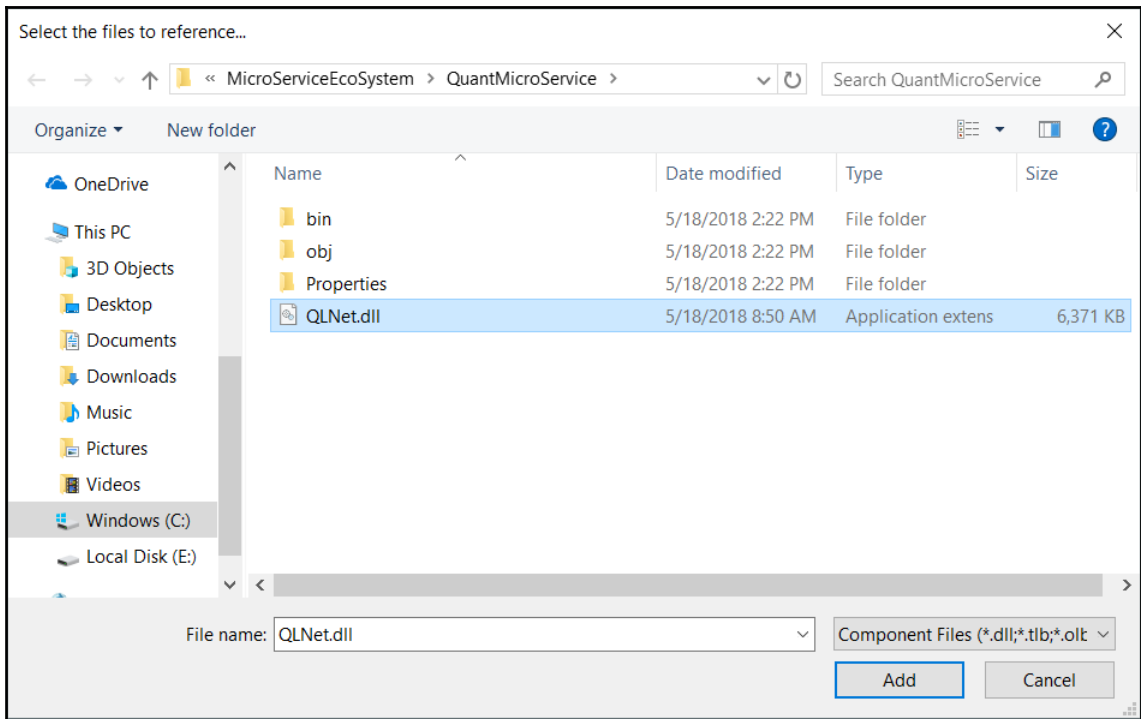


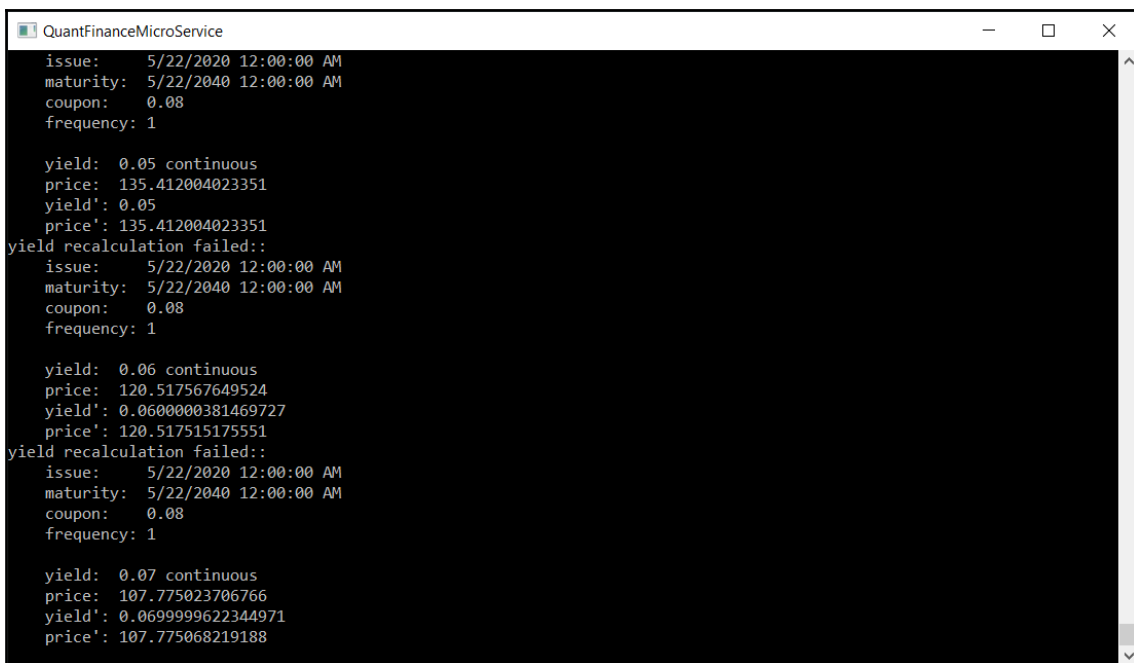




Chapter 10: Creating a Quantitative Financial Microservice







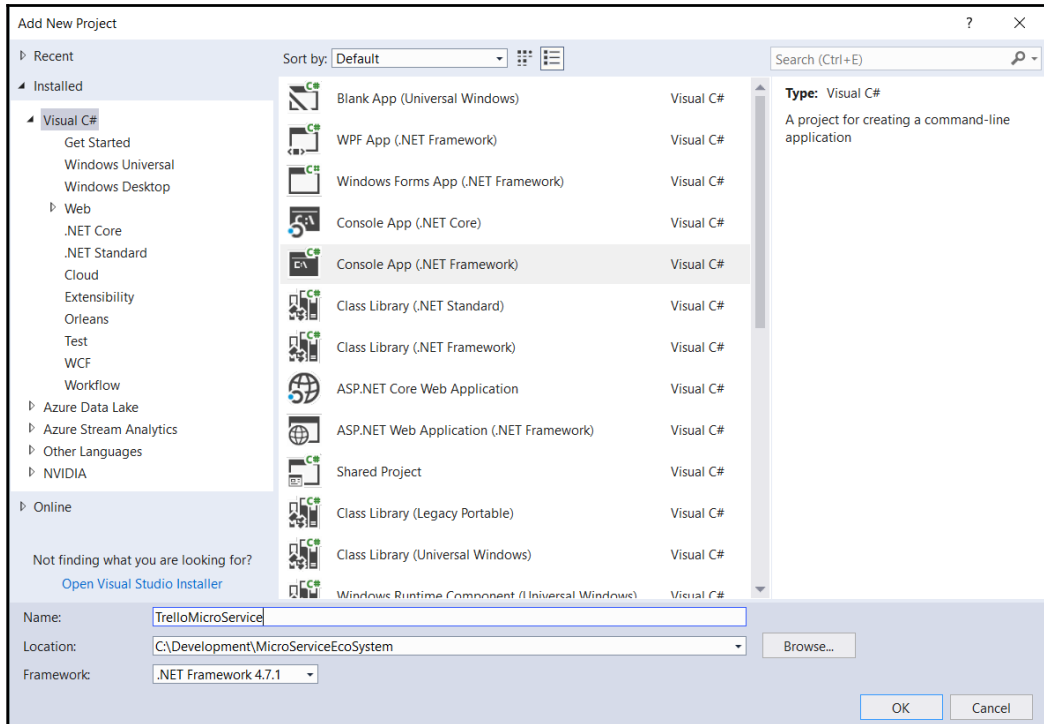
```
QuantFinanceMicroService
issue:      5/22/2020 12:00:00 AM
maturity:  5/22/2040 12:00:00 AM
coupon:    0.08
frequency: 1

yield: 0.05 continuous
price: 135.412004023351
yield': 0.05
price': 135.412004023351
yield recalculation failed::
issue:      5/22/2020 12:00:00 AM
maturity:  5/22/2040 12:00:00 AM
coupon:    0.08
frequency: 1

yield: 0.06 continuous
price: 120.517567649524
yield': 0.0600000381469727
price': 120.517515175551
yield recalculation failed::
issue:      5/22/2020 12:00:00 AM
maturity:  5/22/2040 12:00:00 AM
coupon:    0.08
frequency: 1

yield: 0.07 continuous
price: 107.775023706766
yield': 0.0699999622344971
price': 107.775068219188
```

Chapter 11: Trello Microservice – Board Status Updating



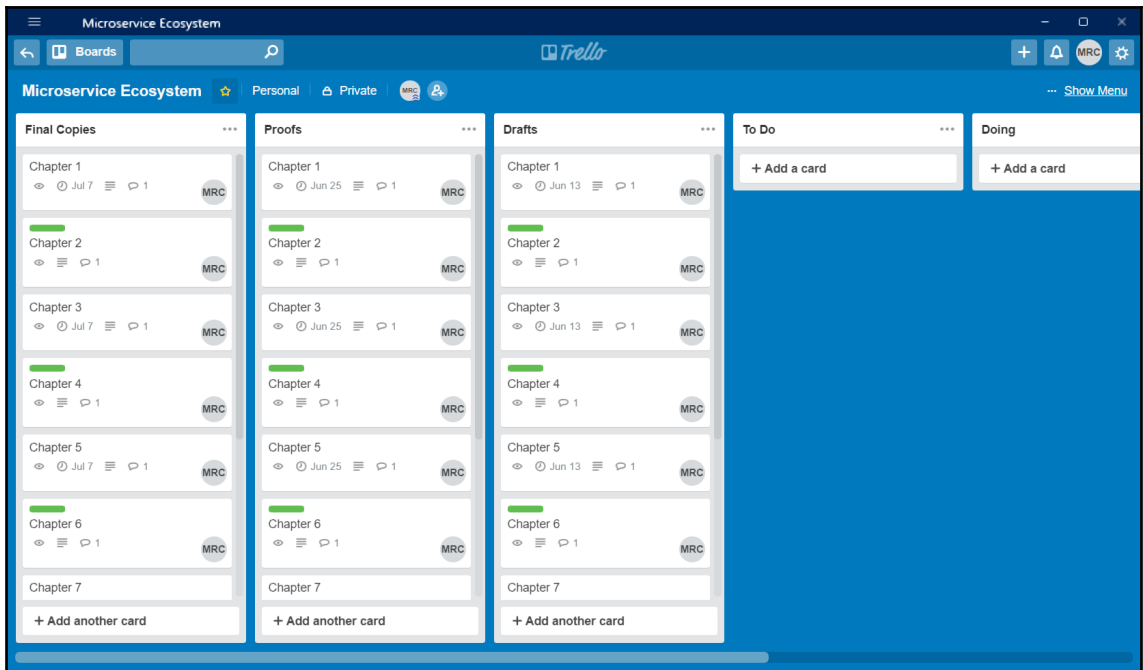
The screenshot shows the NuGet Package Manager interface for 'TrelloMicroService'. The search bar contains 'trello'. The results list several packages, with 'TrelloNet' (v0.6.2) highlighted. The right-hand pane shows the details for 'TrelloNet', including its version (0.6.2), author (Oskar Dillén), license (Apache License 2.0), and project URL.

Package Name	Author	Downloads	Version
Manatee.Trello.WebApi	gregsdennis	9.03K	v2.0.3
TrelloNet	Oskar Dillén	21.3K	v0.6.2
TrelloNet.Temp.Fork	Oskar Dillén	2.48K	v0.6.2
TrelloNet.Edge	Oskar Dillén	1.93K	v0.7.2.1
MyTrelloNet	tkykm	959	v1.0.8
dcm.trellolib	David Conde Marin	163	v1.0.1

TrelloNet Details:
Version: Latest stable 0.6.2
Install
Options
Description: A .NET client library for Trello.
Version: 0.6.2
Author(s): Oskar Dillén
License: <http://www.apache.org/licenses/LICENSE-2.0.html>
Date published: Thursday, May 1, 2014 (5/1/2014)
Project URL: <https://github.com/dillenmeister/Trello.NET>
Report Abuse: <https://www.nuget.org/packages/TrelloNet/0.6.2/ReportAbuse>

The 'Starred Boards' section displays three book covers. The first is 'Microservice Book' by EvolvedAI. The second is 'MicroServices Book'. The third is 'Microservice Ecosystem', which has a mouse cursor hovering over it.

- Microservice Book - EvolvedAI
- MicroServices Book
- Microservice Ecosystem



Chapter 1

in list [Chapters](#)

Members Due Date

MRC + tomorrow at 5:03 AM (due soon)

Description

Add a more detailed description...

Attachments

Drag and drop or [choose your files](#)

Add Comment

MRC Write a comment...

Save

Activity

MRC **Matt R. Cole** set this card to be due tomorrow at 5:03 AM
2 minutes ago

Add

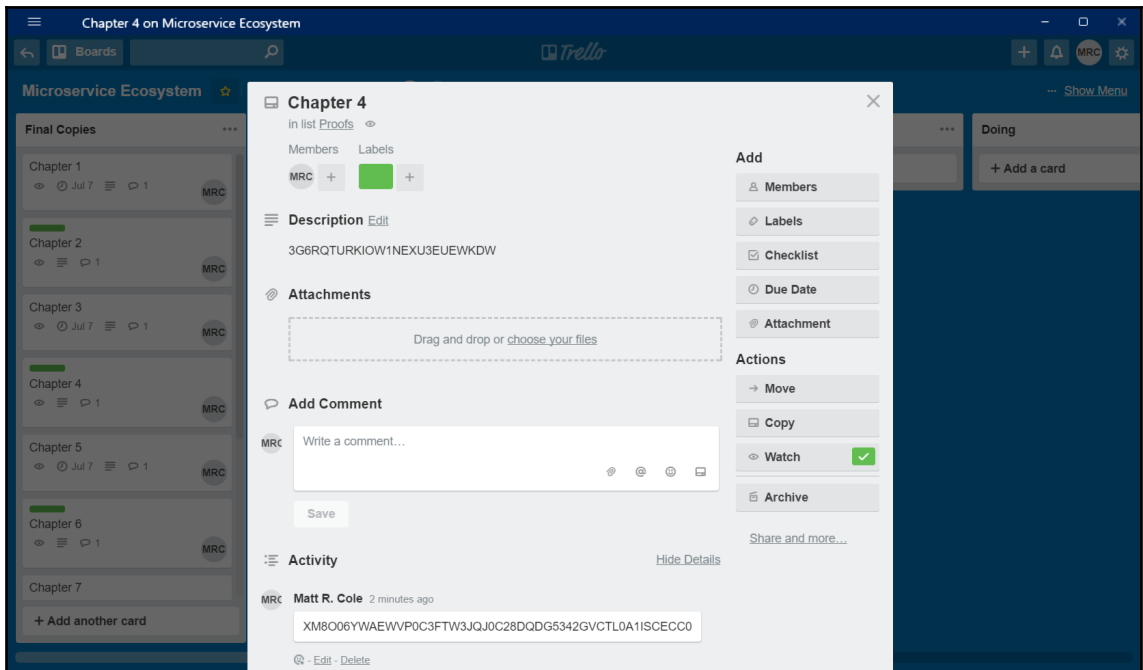
- Members
- Labels
- Checklist
- Due Date
- Attachment

Actions

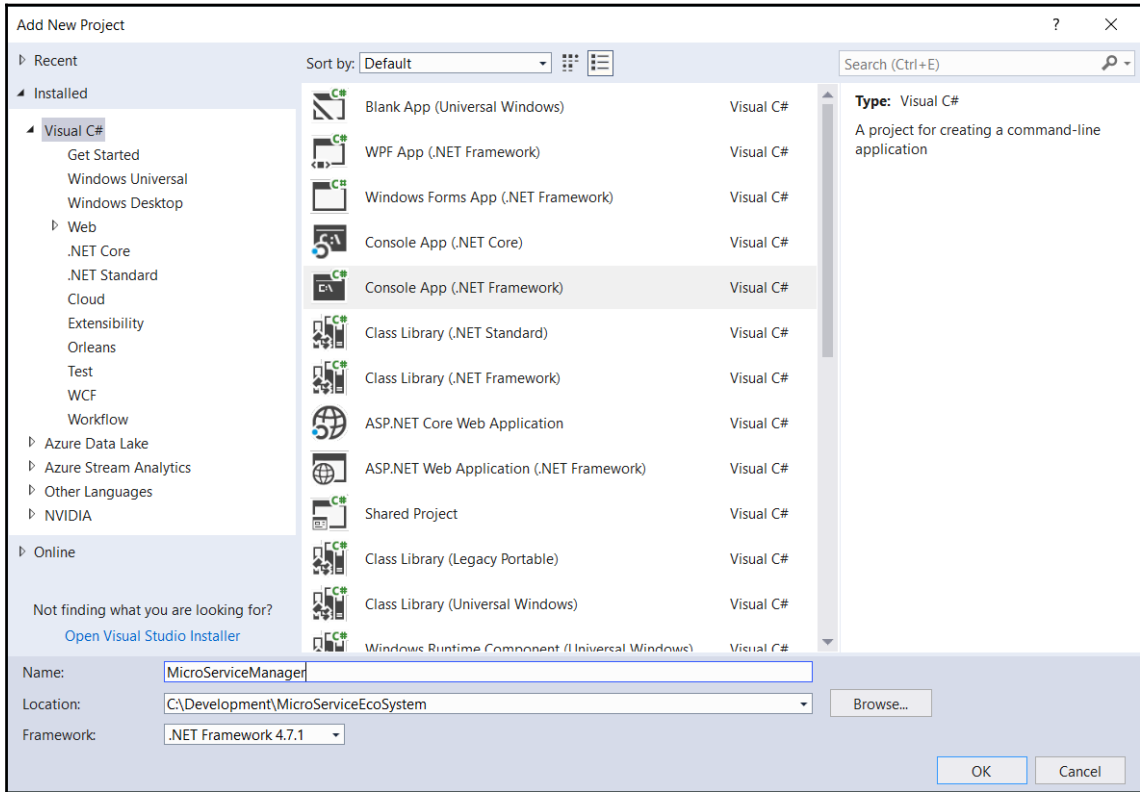
- Move
- Copy
- Watch
- Archive

[Share and more...](#)

[Hide Details](#)



Chapter 12: Microservice Manager – The Nexus



NuGet Package Manager: MicroServiceManager

CacheManager x Include prerelease Package source: nuget.org

Icon	Package Name	Author	Downloads	Version
	CacheManager.Core	by MichaConrad,	353K	v1.1.2
	CacheManager.SystemRuntimeCaching	by MichaConrad,	201K	v1.1.2
	CacheManager.StackExchange.Redis	by MichaConrad,	159K	v1.1.2
	CacheManager.Microsoft.Extensions.Configuration	by MichaConrad,	40K	v1.1.2
	CacheManager.Serialization.Json	by MichaConrad,	91.4K	v1.1.2

CacheManager.SystemRuntimeCaching

Version: Latest stable 1.1.2

Options

Description

CacheManager extension package which adds System.Runtime.Caching.MemoryCache as an option for a local in-memory cache layer. CacheManager is an open source caching abstraction layer for .NET written in C#. It supports various cache providers and implements many advanced features.

Version: 1.1.2

Author(s): MichaConrad

License: <https://github.com/MichaCo/CacheManager/blob/master/LICENSE>

	RabbitMQ.Client	by RabbitMQ.Client	v5.0.1
	ReflectSoftware.Insight	by ReflectSoftware Inc.	v5.7.1.1
	Topshelf	by Chris Patterson, Dru Sellers, Travis Smith, Brian Wilson, Mogens Heller Grabe	v4.0.4
	Topshelf.Autofac	by Alexandr Nikitin	v3.1.1
	Topshelf.Leader	by Steven Ward	v1.1.1

Topshelf.Leader

Installed: 1.1.1

Version: 1.1.1

Options

Description

Extension methods to add leader election startup control to Topshelf.

Version: 1.1.1

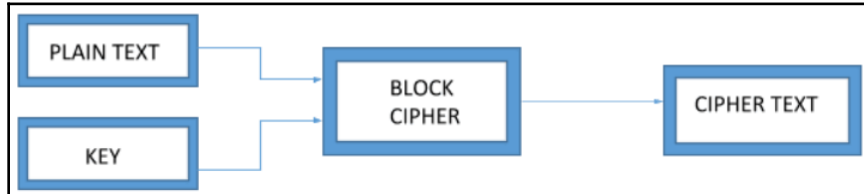
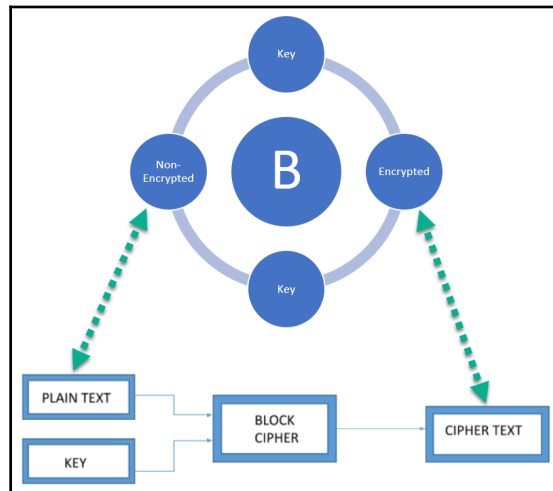
Author(s): Steven Ward

License: <https://raw.githubusercontent.com/stevewgh/Topshelf.Leader/master/LICENSE>

Date published: Friday, February 16, 2018 (2/16/2018)

Project URL: <https://github.com/stevewgh/Topshelf.Leader>

Chapter 13: Creating a Blockchain Bitcoin Microservice



NuGet Package Manager: BitcoinMicroService

Package source: nuget.org

Search: nbitcoin

Package Name	Author	Downloads	Version
NBitcoin	by NBitcoin	134K	v4.1.1.8
NBitcoin.Indexer	by NBitcoin.Indexer	32.9K	v3.0.0.6
NBitcoin.BC2	by NBitcoin.BC2	576	v1.0.1
NBitcoin.TestFramework	by NBitcoin.TestFramework	2.08K	v1.6.3
NBitcoin.Altcoins	by NBitcoin.Altcoins	2.54K	v1.0.1.6
NBitcoin.Mono	by Nicolas Dorier	11.5K	v3.0.0.47

NBitcoin by NBitcoin, 134K downloads
The C# Bitcoin Library

Installed: 4.1.1.8 [Uninstall]

Version: 4.1.1.8 [Update]

Description: The C# Bitcoin Library

Version: 4.1.1.8

Author(s): NBitcoin

License: <https://github.com/MetacoSA/NBitcoin/blob/master/LICENSE>

Date published: Sunday, May 20, 2018 (5/20/2018)

Project URL: <https://github.com/MetacoSA/NBitcoin>

Report Abuse: <https://www.nuget.org/packages/>

NuGet Package Manager: BitcoinMicroService

Package source: nuget.org

Search: qbitninja

QBitNinja.Client	by QBitNinja.Client	17.9K	v1.0.3.47
QBitNinja.Server	by QBitNinja	4.27K	v1.0.3.45

QBitNinja.Client by QBitNinja.Client, 17.9K downloads
Client library for QBitNinja server

Installed: 1.0.3.47 [Uninstall]

Version: Latest stable 1.0.3.47 [Update]

Description: Client library for QBitNinja server


Version: 1.0.3.47

Author(s): QBitNinja.Client

License: <https://raw.githubusercontent.com/MetacoSA/QBitNinja/master/QBitNinja.Client/LICENSE>

Date published: Tuesday, April 24, 2018 (4/24/2018)

Project URL: <https://github.com/MetacoSA/QBitNinja/>




WalletGenerator.net

Universal Open Source Client-Side Wallet Generator

Generating new Address...
MOVE your mouse around to add some extra randomness... 392
OR type some random characters into this textbox

```
61a06530b3c88629c39524aef7df476eae32ff1ee841cda9d1dabfde9e0d41731b9c2ea2b215150390035207
11b7b840d8117ece5da2562a280644bfd8d96cd80afdab16ffe35946093325cf028be0cafafac19e15819140
186154014bf45480cbf3a169c0713b8531d3998df5b84e904b047447191ccc7cadb3b27823df27ff389aaa8a
4c29b19400ddccccc22fd1065b1be414ae3ea0524820374d07b4dc9f702e1315e547f1fe6a24d490240759da8
be499e46f0bf68a396b12e86554cb4127d6669983f18becf47feb93ddb1d0c9850fe2f04abf0f6422f41d6f
152904f8a55657bb59390eb921fd8c1536525d8ecc4d932721106e28ddeb7fa18383d517
```



Skip »
You may skip this step if you do not plan to use the random key generator.

Step 0. Follow the security checklist recommendation

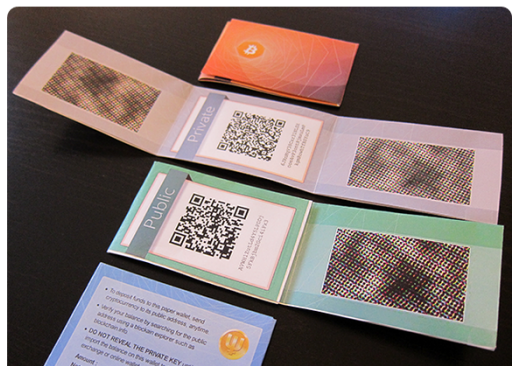
First step is to **download** this website from [Github](#) and open the index.html file directly from your computer. It's just too easy to sneak some evil code in the 6000+ lines of javascript to leak your private key, and you don't want to see your fund stolen. Code version control make it much easier to cross-check what actually run. For extra security, **unplug your Internet access** while generating your wallet.





Step 1. Generate new address



Choose your currency and click on the "Generate new address" button.

Step 2. Print the Paper Wallet

Click the Paper Wallet tab and print the page on high quality setting. **Never save the page as a PDF file to print it later since a file is more likely to be hacked than a piece of paper.**



<p>Public Address</p>  <code>1E5vtXbveraE3xoVNYWNvHwF8PVtKWq5iy</code>	<p>Public Address Compressed</p>  <code>15VRjqLyriuKlWqAFkacfiBjEXeJmJeKp1</code>
<p>Public Key (130 characters [0-9A-F]): <code>04E811E7F5AA78ADAE30DE604BEB89DA89110DC87EAEA101EC79043E3825EC6EF0F75EFDA44DE392B263598A80F7F0DF859A35C527F7F9387054337D584DDA29E2</code></p> <p>Public Key (compressed, 66 characters [0-9A-F]): <code>02E811E7F5AA78ADAE30DE604BEB89DA89110DC87EAEA101EC79043E3825EC6EF0</code></p>	
<p>Private Key WIF 51 characters Base58</p>  <code>5KUNAKnTGjHBVaSyYDWLzj8etVmYVBKF4GgKizxB8ckq6TPP3tU</code>	<p>Private Key WIF Compressed 52 characters Base58</p>  <code>L4XnQ9ucxRcRK8deYnCXFnxEHybyNXX3SCZeNnXicpTGjCAGByZ</code>
<p>Private Key Hexadecimal Format (64 characters [0-9A-F]): <code>DA28B7535FB31AE682DA6C78F0B4651629BD6B1137DCBE7A3CFD2F8D48E786FC</code></p> <p>Private Key Base64 (44 characters): <code>2ii3U1+zGuaC2mx48LRlFim9axE33L56PP0vjUjnhvw=</code></p>	

<p>Public Address</p>  SHARE <code>1Jt4TrDtjShiRnogfwUD4YJpTbi7tRHX9D</code>	<p>Private Key (Wallet Import Format)</p>  SECRET <code>5KXDue33z4Lx4rFkn4V4hvwtpERxfSvRjNQLwJTciUS4ZRwxnQs</code>
---	---

bitcoin Introduction Resources Innovation Participate FAQ English

Getting started with Bitcoin

Using Bitcoin to pay and get paid is easy and accessible to everyone.

How to use Bitcoin

- 1. Inform yourself**

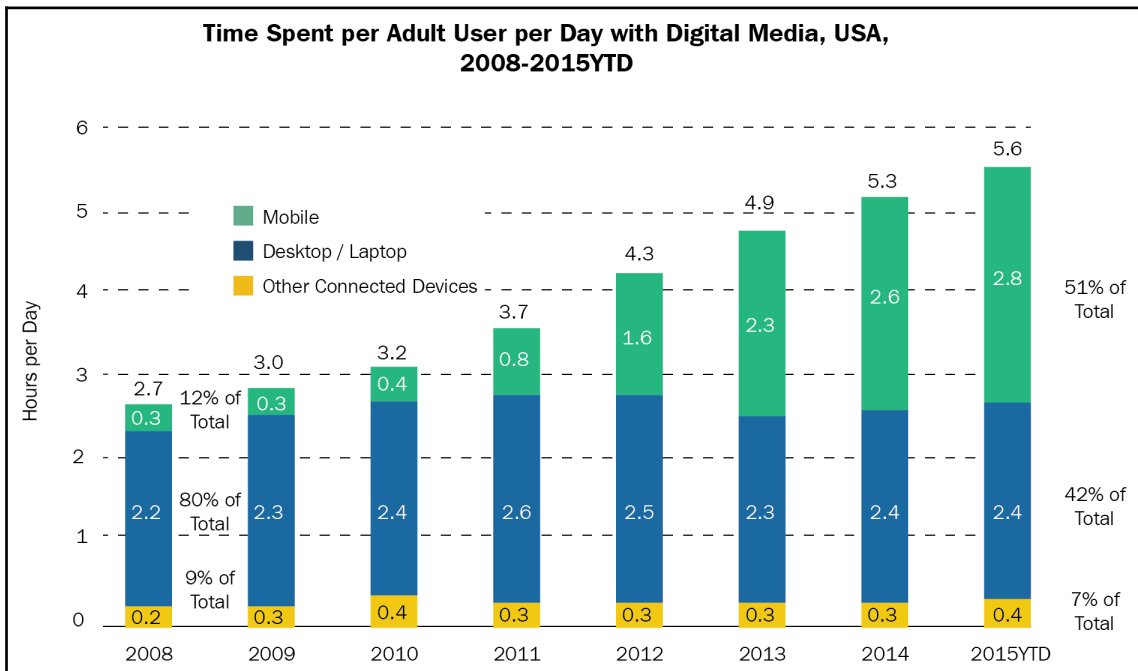
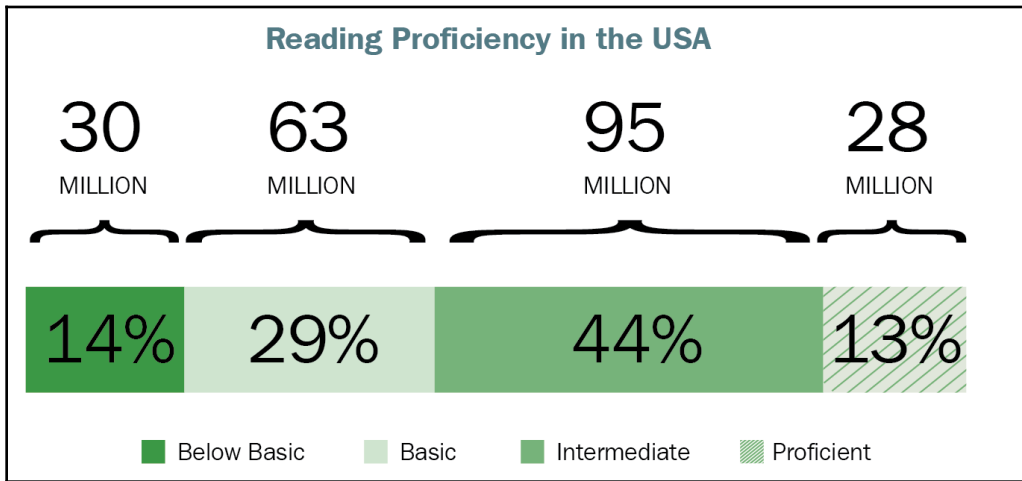
Bitcoin is different than what you know and use every day. Before you start using Bitcoin, there are a few things that you need to know in order to use it securely and avoid common pitfalls.

[Read more](#)
- 2. Choose your wallet**

You can bring a Bitcoin wallet in your everyday life with your mobile or you can have a wallet only for online payments on your computer. In any case, choosing your wallet can be done in a minute.

[Choose your wallet](#)
- 3. Get Bitcoin**
- 4. Spend Bitcoin**

Chapter 14: Adding Speech and Search to Your Microservice



Share of Average Time Spent per Day with Major Media by US Adults, 2014-2019						
<i>% of total</i>						
	2014	2015	2016	2017	2018	2019
Digital	42.9%	45.3%	47.2%	48.9%	50.4%	51.6%
— Mobile (nonvoice)	21.6%	23.9%	25.7%	27.3%	28.6%	29.6%
—Audio	5.8%	6.6%	7.1%	7.3%	7.5%	7.6%
—Social networks	3.2%	3.9%	4.8%	5.6%	6.0%	6.4%
—Video*	3.0%	3.6%	4.2%	4.6%	5.0%	5.3%
—Other	9.5%	9.7%	9.7%	9.8%	10.1%	10.3%
— Desktop/laptop**	18.6%	18.2%	17.4%	17.0%	16.8%	16.7%
—Audio	0.9%	0.9%	0.9%	0.8%	0.8%	0.7%
—Video*	3.3%	3.4%	3.4%	3.4%	3.3%	3.3%
—Social networks	1.9%	1.7%	1.5%	1.5%	1.4%	1.4%
—Other	12.6%	12.2%	11.7%	11.4%	11.3%	11.3%
— Other connected devices	2.7%	3.2%	4.0%	4.6%	5.0%	5.3%
TV***	36.6%	35.1%	34.1%	33.0%	32.0%	31.2%
Radio***	12.4%	12.3%	12.0%	11.9%	11.8%	11.7%
Print***	4.4%	4.0%	3.5%	3.3%	3.1%	3.0%
—Newspapers	2.6%	2.3%	2.0%	1.8%	1.7%	1.6%
—Magazines	1.9%	1.7%	1.5%	1.5%	1.4%	1.3%
Other***	3.6%	3.4%	3.1%	2.9%	2.7%	2.6%

*Note: ages 18+; time spent with each medium includes all time spent with that medium, regardless of multitasking; for example, 1 hour of multitasking on desktop/laptop while watching TV is counted as 1 hour for TV and 1 hour for desktop/laptop; numbers may not add up to 100% due to rounding; *excludes time spent with video via social networks; **includes all internet activities on desktop and laptop computers; ***excludes digital*
 Source: eMarketer, Sep 2017

