Opserver 監控服務的解決方案

twMVC #19



- 阿磊 Cheng-Ju Wu
- C#, ASP.NET MVC

摘要

- Opserver 是什麼?
- Opserver 專案架構與使用方式
- Opserver 監控項目
- 其他

開始前...

來說點甚麼

早期服務小，只要簡單一組



當服務慢慢長大

AP+DB機器增加

需具備HA機制

Cache服務

異常Log收集

Search優化


database
data
information
server
connection
connectivity
storing
php
web
sql
internet
communication
store
mirror
cylinders
perspective
databases
pages
informations
intranet
connect
access
base
architecture
round
circle
center
centre
concept
abstract
computer
geometry
black
neon
glow
structure
modern
mining
glossy
dataflow
icon
generic
quality
reflective
world
network
isolated
vista
white
detailed
archive
search
group
array
technology
reflection
cylinder
business
datase
online
records
object
wire
grid
shiny
chart
matrix
storage
interface
blue
global
infrastructure
documentation
library
background

當服務越來越多

維運需要不同第三方工具輔助

監控變複雜了...

後來注意到一個解決方案

Opserver

那麼進入正題吧...



Opserver 是什麼?

Opserver 是什麼?

- 開源專案，可於 GitHub 自行下載修改
- 使　用 .NET 技術 (C# + ASP.NET MVC)
- 用途為 Monitoring System
- 使用於 StackExchange 服務



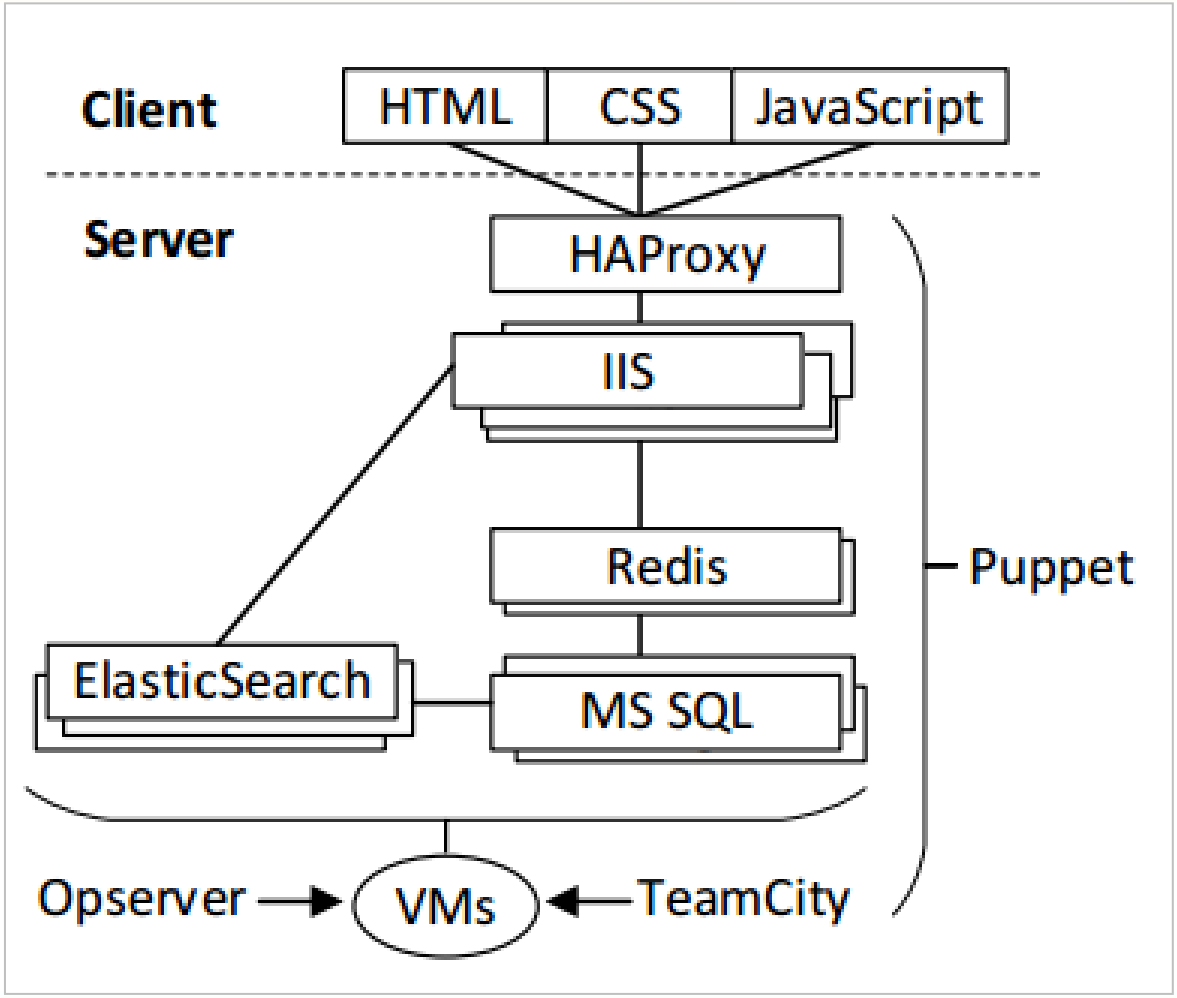
StackExchange





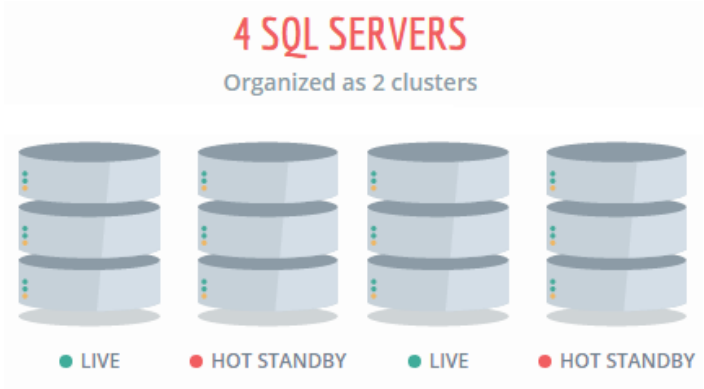
- Using **Visual Studio 2015**
- Using **ASP.NET MVC 5 (C#)(.NET 4.5)**
- Using **Windows Server 2012 R2 x64**
- Using **IIS 8.5**
- Using **MS SQL Server 2014**
- Using **LINQ to SQL 和 Dapper**
- Using **StackExchange.Redis**

StackExchange



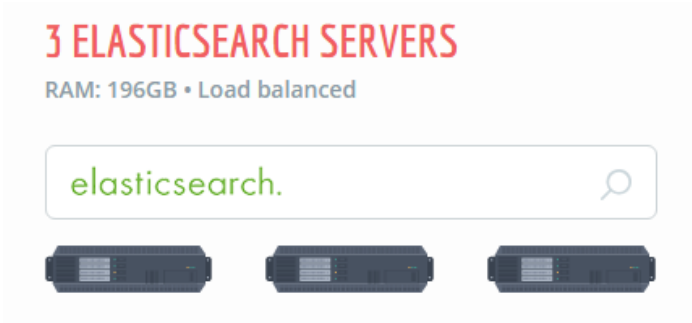
StackExchange











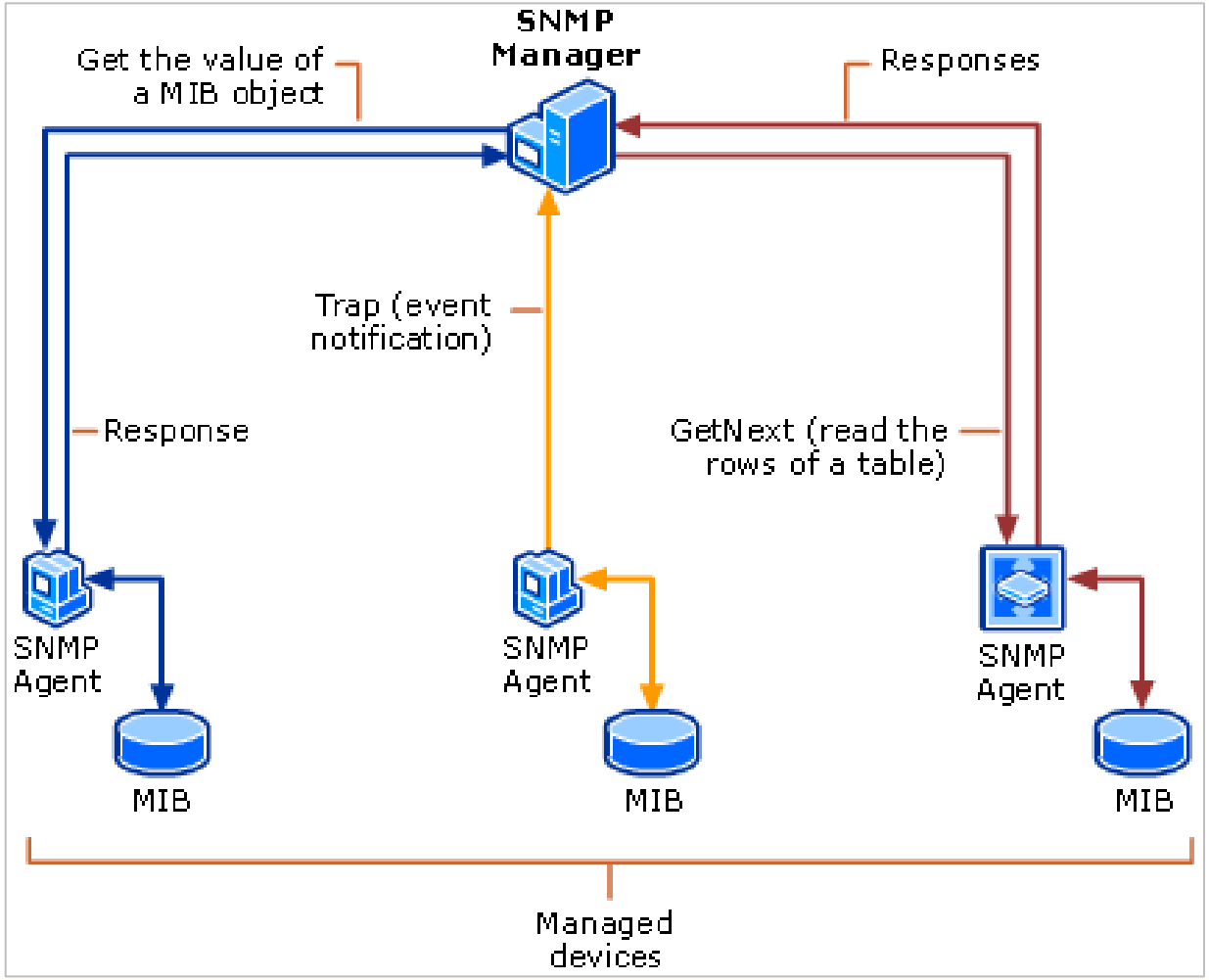
http://stackexchange.com/performance

因此 Opserver 監控項目…

- Servers
- SQL clusters/instances
- Redis
- Elastic Search
- Exception Logs
- Haproxy

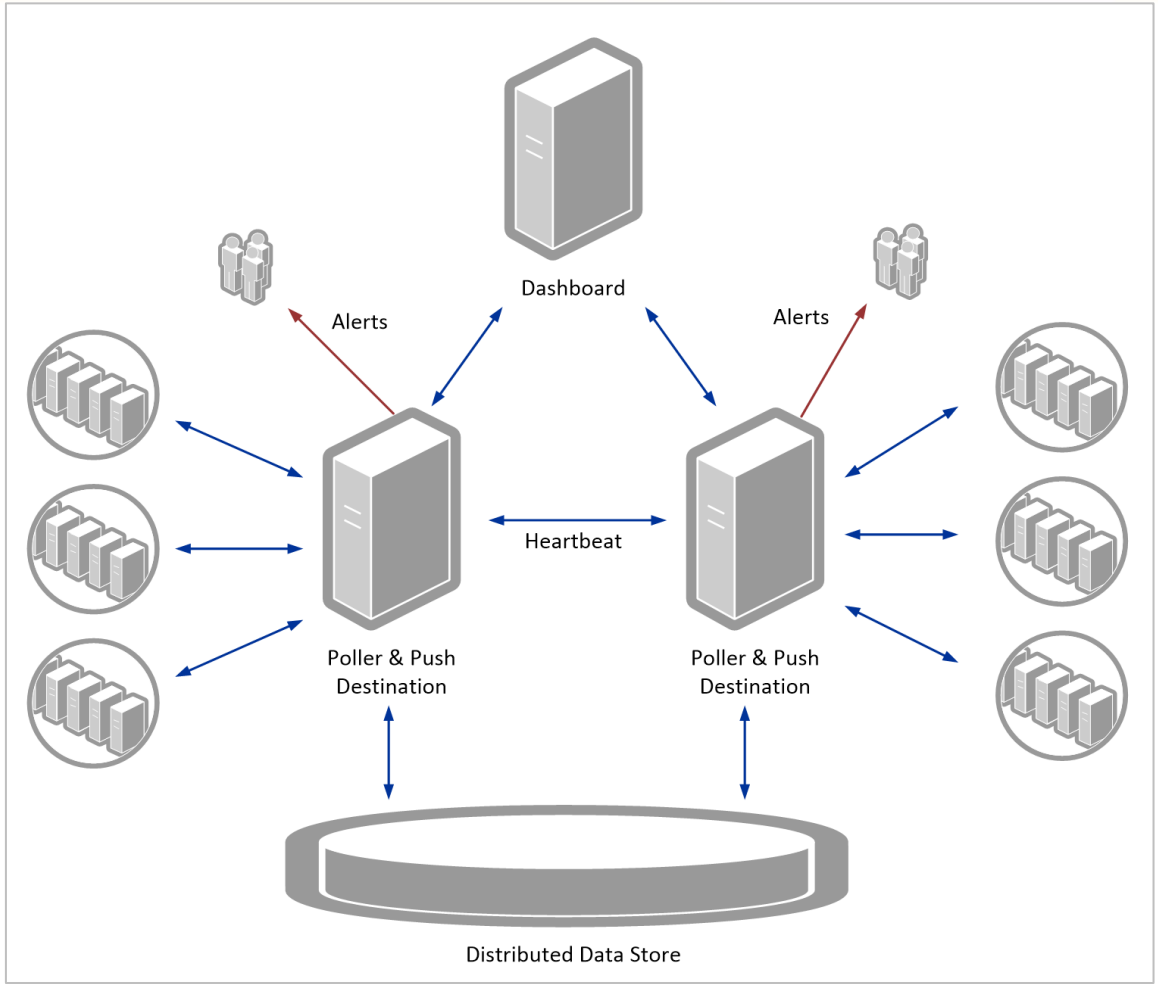


Opserver 運作 – SNMP



How SNMP Works

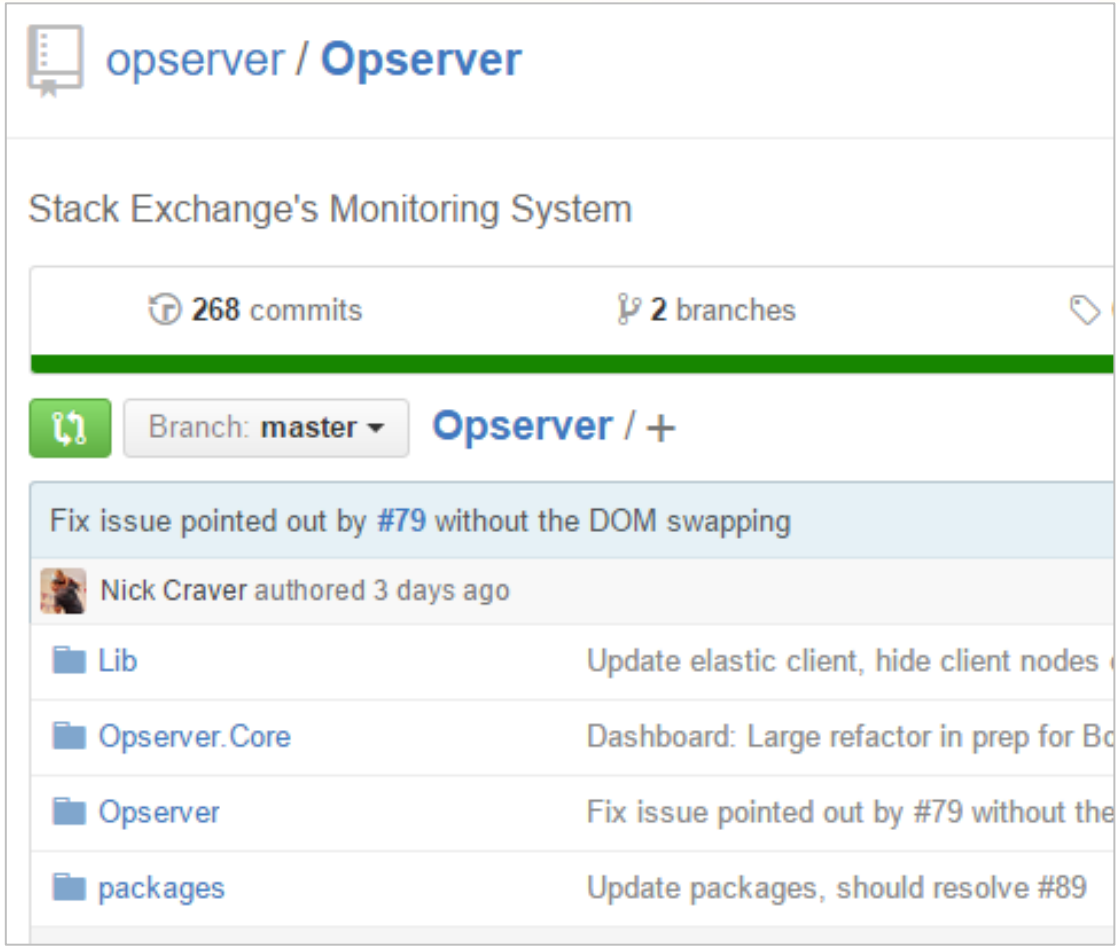
Opserver 運作


Dashboard
Alerts
Alerts
Heartbeat
Poller & Push
Destination
Poller & Push
Destination
Distributed Data Store



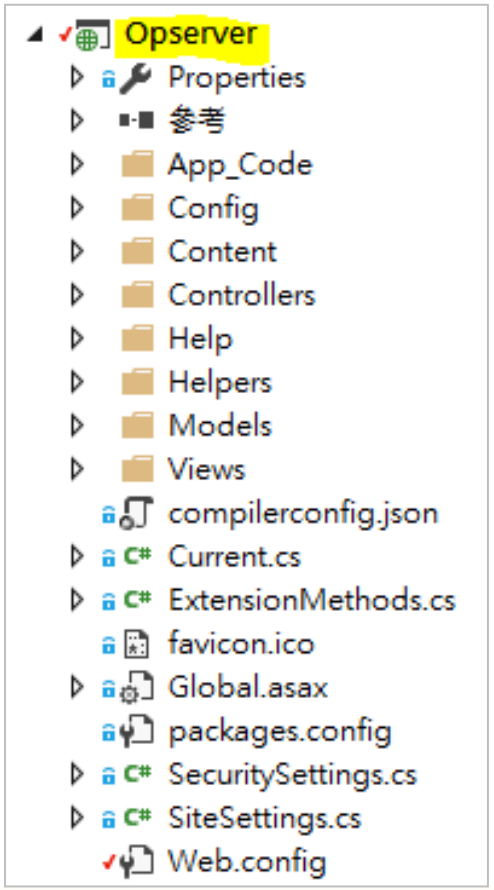
Opserver 專案架構與使用方式

Opserver 開源專案

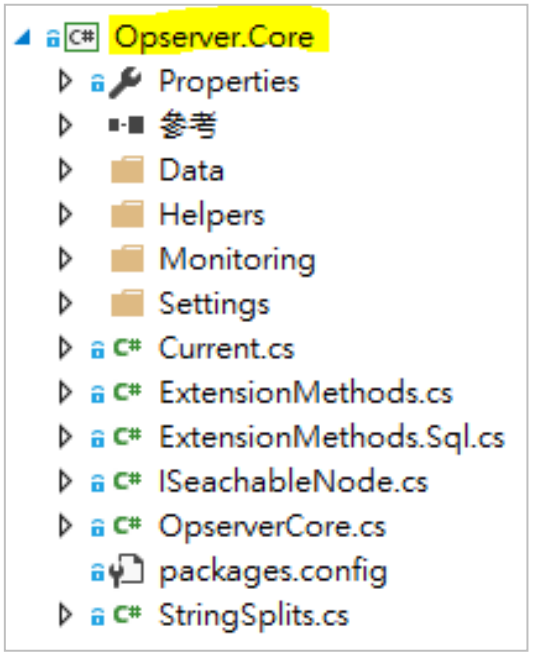


Opserver 專案架構

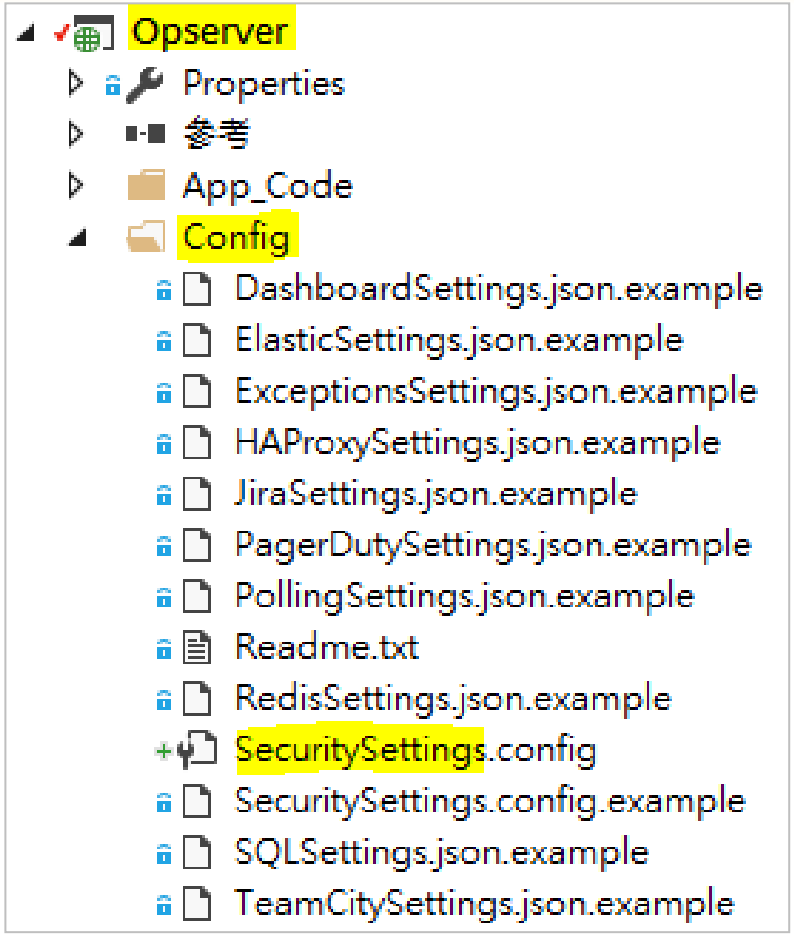
Opserver (Web)



Opserver.Core (Data)



Opserver 使用方式 - Config

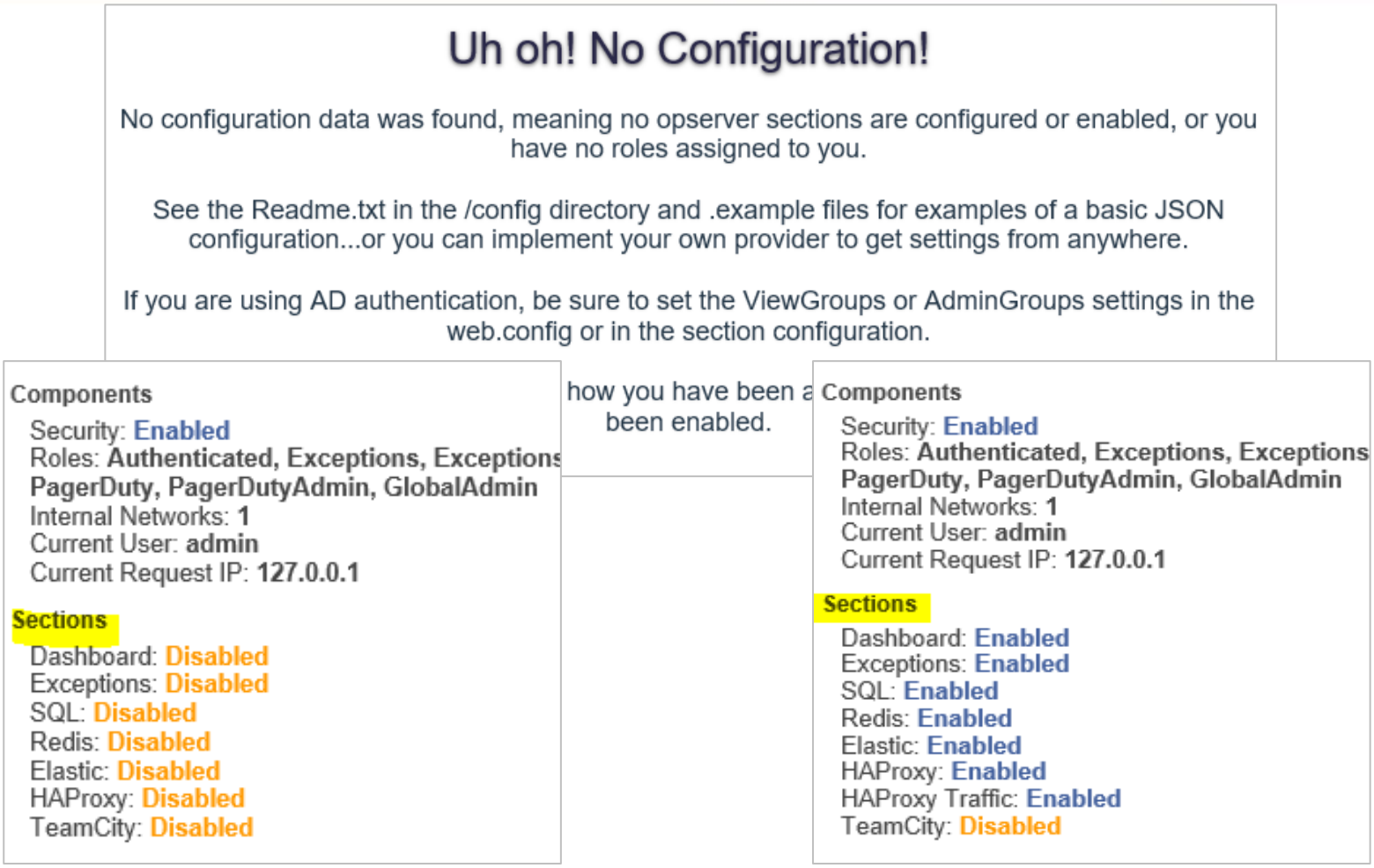


- Config 資料夾
- SecuritySetting.config
- 可依所需功能，開啟.json

Opserver 使用方式 – Security.Config

- Active Directory (AD)
  - 專案初始設定
- 自訂
  - C# 專案，可修改串接公司內部權限系統

Opserver 使用方式 - Init



Demo



Opserver 監控項目介紹

For SQL Server

For Redis

For Exception

For SQL Server

For SQL Server – 設定

```
{
   "defaultConnectionString": "保持它的預設連線字串",
   "clusters": [
     {
       "name": "隨意名稱",
       "refreshIntervalSeconds": 20,
       "nodes": [
         {
           "name": "隨意名稱",
           "connectionString": "資料庫連線"
         }
       ]
     }
   ],
   "instances": [
    {
       "name": "AzureVM-DB-Server",
       "connectionString": "資料庫連線"
     }
   ]
}
```

For SQL Server – 內容

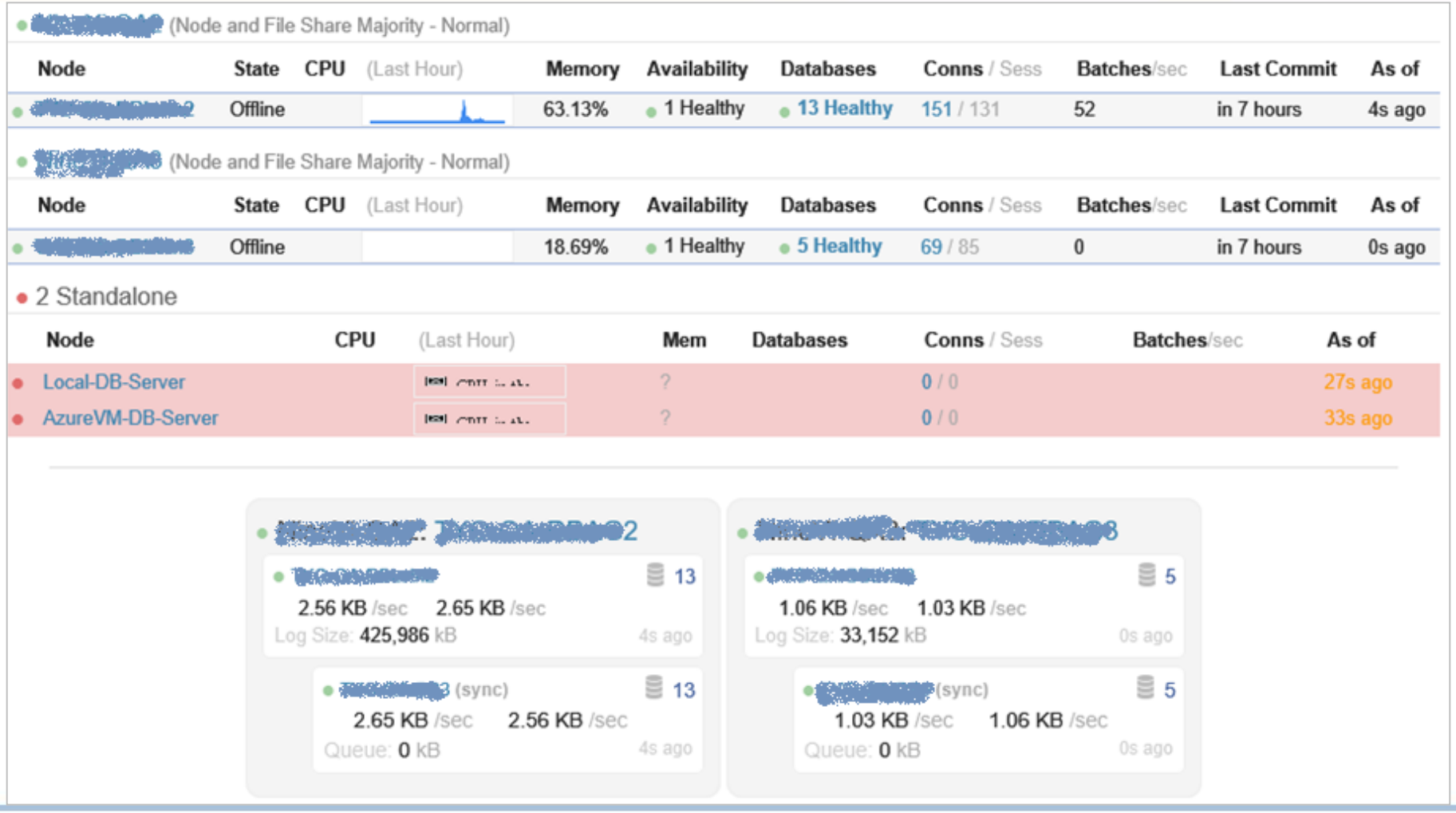
- All Servers
- Instances
- Top Query
- Who is Active
- Connections
- Database

For SQL Server - All Servers

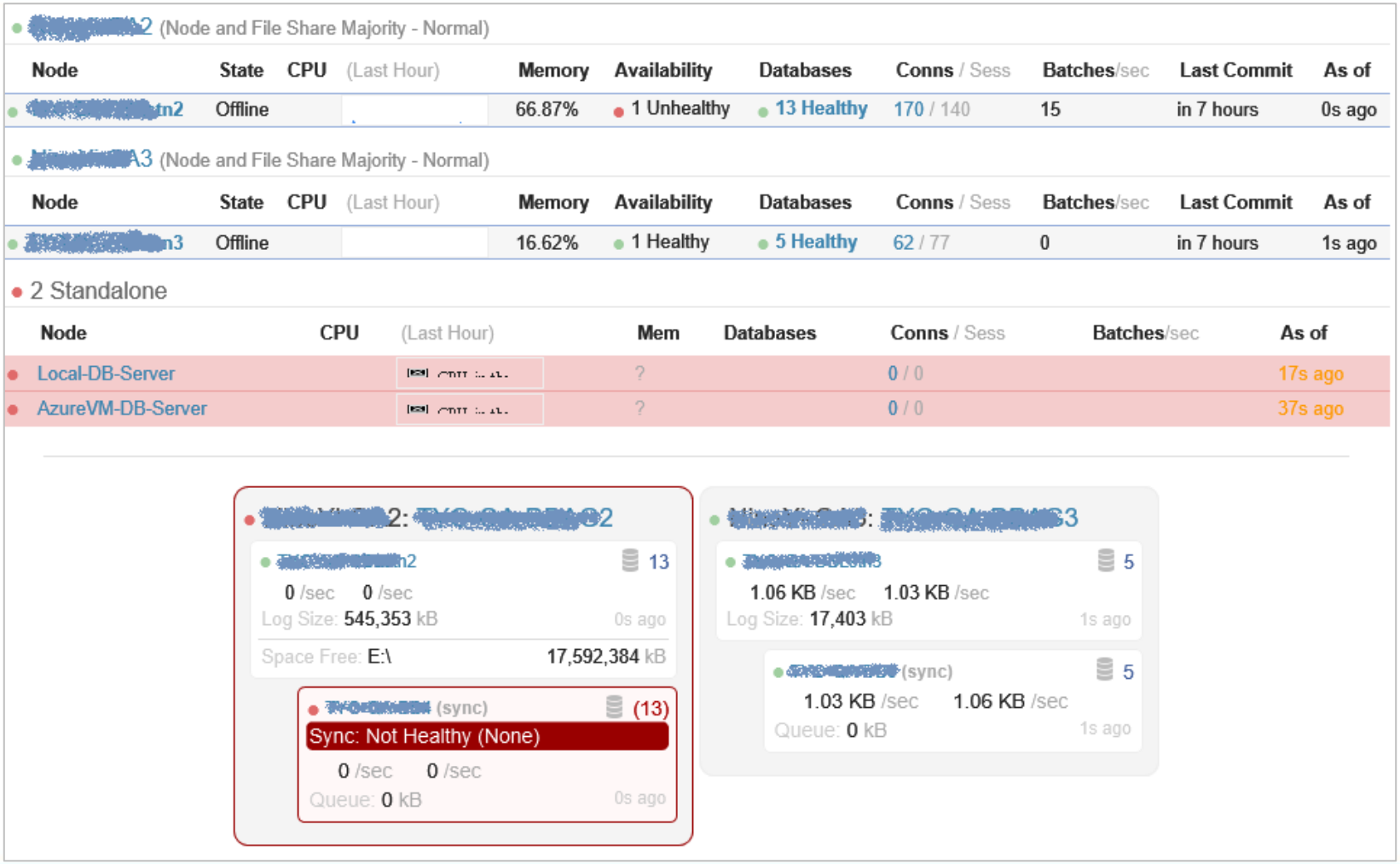
17 Standalone

Node	CPU	(Last Hour)	Mem	Databases	Conns / Sess	Batches/sec	As of
[redacted]DB	20%		50.01%	35 Healthy	48 / 68	0	2 secs ago
[redacted]A7DB	0%		66.69%	8 Healthy	14 / 43	0	13 secs ago
[redacted]A8DB	0%		3.10%	8 Healthy	4 / 33	0	just now
[redacted]2DB	0%		71.68%	2 Unhealthy 1 Warning 38 Healthy	9 / 28	1	just now
[redacted]2DB	0%		75.15%	1 Warning 18 Healthy	9 / 30		1 sec ago
[redacted]2DB	0%		75.01%	1 Warning 18 Healthy	8 / 26	0	12 secs ago
[redacted]2DB	3%		80.88%	2 Unhealthy 2 Warning 56 Healthy	19 / 39	0	just now
[redacted]DB	0%		66.67%	1 Warning 20 Healthy	7 / 28	0	11 secs ago
[redacted]DB	0%		40.44%	23 Healthy	5 / 26	0	9 secs ago
[redacted]DB0	32%		88.17%	1 Warning 18 Healthy	45 / 65	0	11 secs ago
[redacted]DB1	3%		73.02%	1 Warning 12 Healthy	73 / 92	1	3 secs ago
[redacted]DB	0%		4.25%	16 Healthy	8 / 29	0	12 secs ago
[redacted]S-AP-01	0%		2.09%	4 Healthy	3 / 24	0	11 secs ago
[redacted]1-DB-01	0%		76.34%	59 Healthy	13 / 31	0	11 secs ago
[redacted]-Wiki	0%		1.16%	8 Healthy	4 / 30	0	12 secs ago
[redacted]-DB-01	0%		1.54%	11 Healthy	4 / 31	0	just now
[redacted]-DB-01	0%		8.75%	10 Healthy	19 / 52	0	just now

For SQL Server - All Servers



For SQL Server – All Servers



For SQL Server – Instance

SQL Instances: • Local-DB-Server

Poll Now

Summary

Machine / Server Name	WUANUNET-NB
Version	SQL SQL 2012 SP2 (11.0.5343.0)
Edition	Standard Edition (64-bit)
Running since	九月 10 at 3:17 (12d 15h)
Databases	• 12 Healthy
Jobs	• 1 Healthy

View Configuration

Stats

CPU	0% (8 Cores)
Machine Type	Hypervisor
Memory	1.35% (219.79 MB / 15.89 GB)
Connections	6
Sessions	39
Max Workers	576 (55 in use)

Volumes

C:\	148.83 GB / 222.45 GB (73.62 GB free)
E:\	127.87 GB / 265.56 GB (137.70 GB free)

Performance

Activity	/sec	Total
Batch Requests/sec	0	107,799
SQL Compilations/sec	0	88,839
SQL Re-Compilations/sec	0	401
Guided plan executions/sec	0	0
Transactions/sec	3	488,350
Index Searches/sec	2,473	30,806,162
Lock Requests/sec	267	57,838,165
Errors/sec	0	3,482

Sizes

Total Server Memory (KB)	224,160 (218.91 MB)
Target Server Memory (KB)	3,283,480 (3.13 GB)
Database Cache Memory (KB)	6,144 (6.00 MB)
Free Memory (KB)	5,488 (5.36 MB)
Data File(s) Size (KB)	116,416 (113.69 MB)
Log File(s) Size (KB)	39,112 (38.20 MB)
Log File(s) Used Size (KB)	10,696 (10.45 MB)
Free Space in tempdb (KB)	5,376 (5.25 MB)

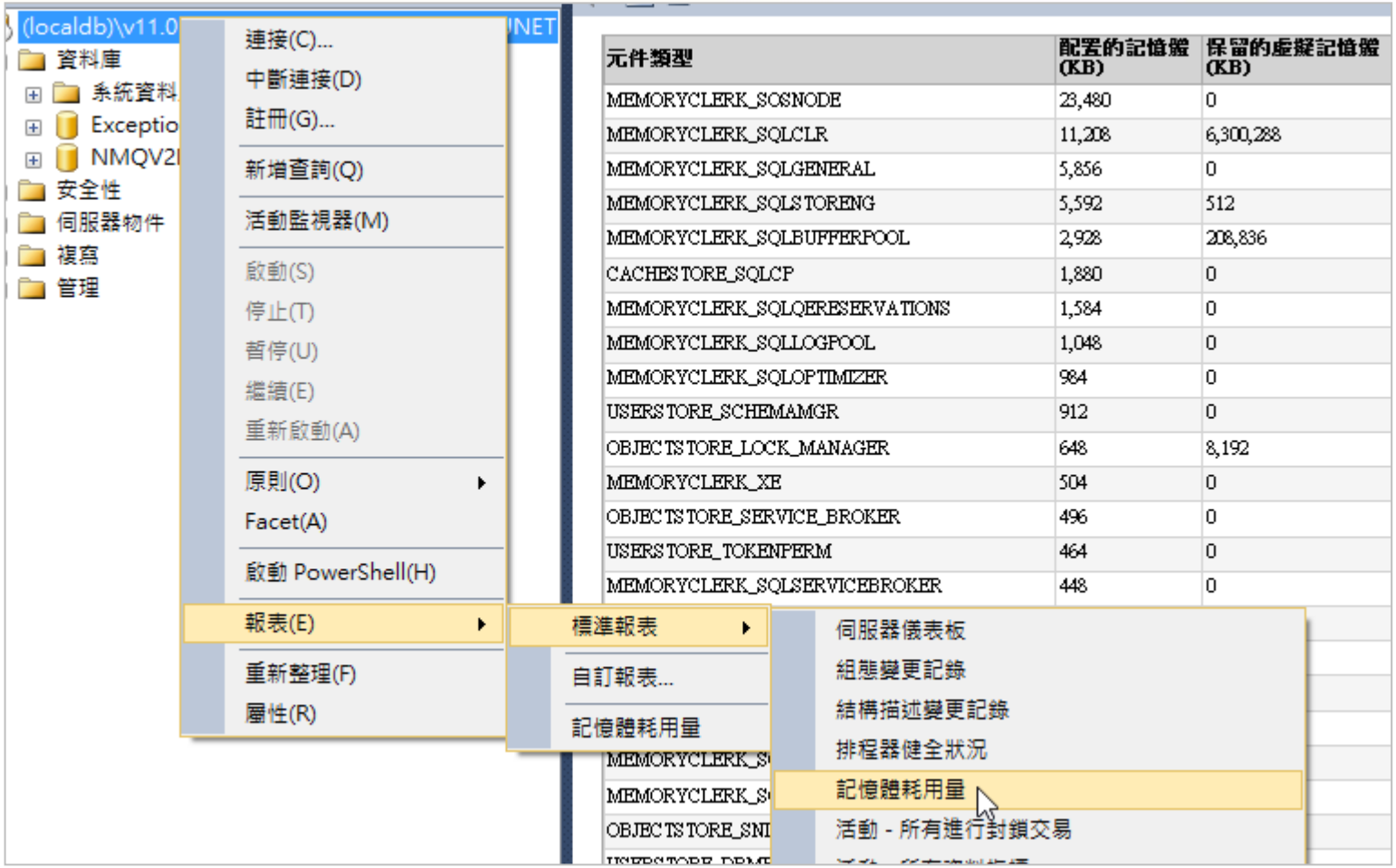
Cache

For SQL Server – 記憶體

AzureVM-DB-Server: Memory Breakdown

Memory Clerk Type	Description	Memory Used	% Used
CACHESTORE_SQLCP	SQL Plans	104.80 MB 109,887,488 bytes	
MEMORYCLERK_SOSNODE	SOS Node	28.88 MB 30,285,824 bytes	
MEMORYCLERK_SQLBUFFERPOOL	Buffer Pool	26.42 MB 27,705,344 bytes	
CACHESTORE_PHDR	Bound Trees	15.72 MB 16,482,304 bytes	
MEMORYCLERK_SQLSTORENG	SQL Storage Engine	6.51 MB 6,823,936 bytes	
MEMORYCLERK_SQLGENERAL	General	6.40 MB 6,709,248 bytes	
CACHESTORE_OBJCP	Object Plans	5.74 MB 6,021,120 bytes	
USERSTORE_DBMETADATA	DB Metadata (User Store)	5.66 MB 5,931,008 bytes	

= SQL Server – 記憶體報表



元件類型	配置的記憶體 (KB)	保留的虛擬記憶體 (KB)
MEMORYCLERK_SOSNODE	23,480	0
MEMORYCLERK_SQLCLR	11,208	6,300,288
MEMORYCLERK_SQLGENERAL	5,856	0
MEMORYCLERK_SQLSTORENG	5,592	512
MEMORYCLERK_SQLBUFFERPOOL	2,928	208,836
CACHESTORE_SQLCP	1,880	0
MEMORYCLERK_SQLQERESERVATIONS	1,584	0
MEMORYCLERK_SQLLOGPOOL	1,048	0
MEMORYCLERK_SQLOPTIMIZER	984	0
USERSTORE_SCHEMAMGR	912	0
OBJECTSTORE_LOCK_MANAGER	648	8,192
MEMORYCLERK_XE	504	0
OBJECTSTORE_SERVICE_BROKER	496	0
USERSTORE_TOKENPERM	464	0
MEMORYCLERK_SQLSERVICEBROKER	448	0

For SQL Server - All Jobs

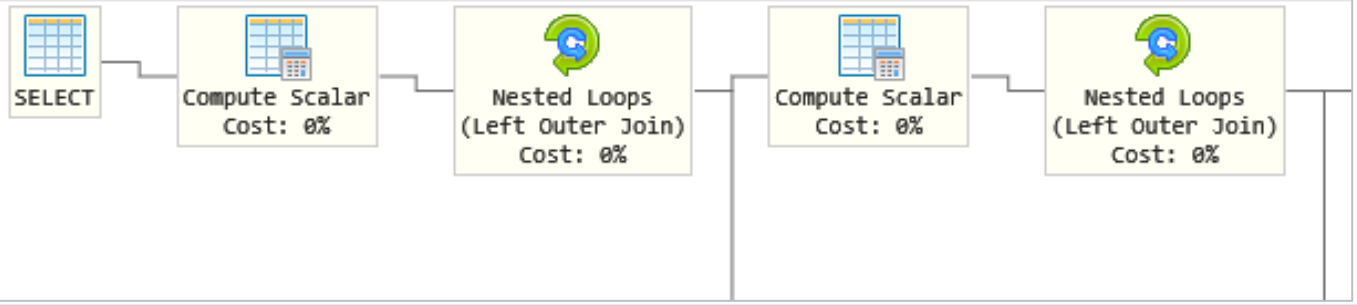
[redacted]EINV_SendMail	Succeeded (Scheduler)	2 hours ago	1 hour ago	41m 40s	Yes	disable
[redacted]_GR_Email_AutoSend	Succeeded (Scheduler)	2 hours ago	2 hours ago	18s	Yes	disable
[redacted]ACE_WS	Succeeded (Scheduler)	2 hours ago	2 hours ago	4s	Yes	disable
[redacted]SSIS_ERP_SMMG	Succeeded (Scheduler)	2 hours ago	2 hours ago	4m 33s	Yes	disable
[redacted]SSIS_ERP_[redacted]_014500	Succeeded (Scheduler)	5 hours ago	5 hours ago	23s	Yes	disable
[redacted]SSIS_ERP_[redacted]_013500	Succeeded (Scheduler)	5 hours ago	5 hours ago	23s	Yes	disable
[redacted]SSIS_ERP_[redacted]_014000	Succeeded (Scheduler)	5 hours ago	5 hours ago	25s	Yes	disable
DBA_AUMG_COPY	Succeeded (Scheduler)	5 hours ago	5 hours ago	39s	Yes	disable
[redacted]_FINANCIAL	**Failed** (Scheduler)	5 hours ago	5 hours ago	34s	Yes	disable
[redacted]SSIS_GBTOERP[redacted]	Succeeded (Scheduler)	5 hours ago	5 hours ago	9s	Yes	disable
[redacted]	Succeeded (Scheduler)	6 hours ago	6 hours ago	2s	Yes	disable
[redacted]SREmail	Succeeded (Scheduler)	6 hours ago	6 hours ago	0	Yes	disable
[redacted]SSIS_ERP_[redacted]	Succeeded (Scheduler)	6 hours ago	6 hours ago	36s	Yes	disable
[redacted]	Succeeded (Scheduler)	7 hours ago	7 hours ago	12s	Yes	disable
DBA_AutoBack	Succeeded (Scheduler)	7 hours ago	7 hours ago	1m 6s	Yes	disable
[redacted]/PS	Succeeded (Scheduler)	8 hours ago	8 hours ago	5s	Yes	disable
[redacted]DMSENT	Succeeded (Scheduler)	8 hours ago	8 hours ago	14s	Yes	disable
[redacted]SIS_SENDMAIL_2000	Succeeded (Scheduler)	11 hours ago	11 hours ago	28s	Yes	disable

For SQL Server – Top Query

Top queries on AzureVM-DB-Server by Average CPU per minute:

CPU			Time		Reads	
Avg	Avg/min	Total	Avg	Total	Reads (Avg)	Reads (Total)
3,522µs	154,744µs	1s 415ms	18s 429ms	2h 3m	12	4,953
251µs	43,591µs	332ms	252ms	5m 33s	23	30,360
264µs	15,806µs	135ms	265ms	2m 16s	23	11,799
287µs	10,806µs	82ms	288ms	1m 22s	23	6,578
1,695µs	8,840µs	79ms	5s 990ms	4m 41s	4	188
1,136µs	8,570µs	73ms	2s 239ms	2m 25s	6	441
623µs	8,147µs	62ms	18s 519ms	30m 51s	4	430
466µs	5,532µs	51ms	915ms	1m 41s	30	3,330
514µs	5,431µs	41ms	515ms	41s 239ms	6	480

Query Plan: download - view similar - link



For SQL Server – Active Query

Current active queries on AzureVM-DB-Server:

Blocking Detected:

Session: 57
  Session:
  Session: 83
    Session: 87

Session	Time	Stats		Status
61	4m 41s	CPU: 1 Reads: 2 Writes: 0	Waits: (1x: 281683ms)WAITFOR	suspended
57	2m 39s	CPU: 0 Reads: 32 Writes: 0		sleeping
83	2m 34s	CPU: 0 Reads: 2 Writes: 0	Waits: (1x: 154701ms)LCK_M_S Blocked By: 57	suspended
87	4s 636ms	CPU: 0 Reads: 2 Writes: 0	Waits: (1x: 4597ms)LCK_M_S Blocked By: 83	suspended

For SQL Server – Database

12 Databases on Local-DB-Server: Poll Now

Name	State	Recovery	Log Wait	Size / Log	Last Backup	Last Full
DataCenter	Online	Full	None	5.08 MB / 1.01 MB		No backup info found
DocForm	Online	Full	None	5.08 MB / 1.01 MB		No backup info found
Exceptions	Online	Full	None	6.00 MB / 1016.00 KB		No backup info found
LoggingDB	Online	Full	None	6.00 MB / 1016.00 KB		No backup info found
Northwind	Online	Simple	None	6.06 MB / 1016.00 KB		No backup info found
ReportServer	Online	Full	None	11.94 MB / 6.87 MB		No backup info found
ReportServerTempDB	Online	Simple	None	5.08 MB / 1.01 MB		No backup info found
TestDB	Online	Full	Log Backup	6.00 MB / 1016.00 KB	九月 6 at 12:04	九月 6 at 12:04 (2.64 MB)
master	Online	Simple	None	7.69 MB / 1.74 MB		No backup info found
model	Online	Full	None	5.06 MB / 1016.00 KB		No backup info found
msdb	Online	Simple	None	38.00 MB / 19.62 MB		No backup info found
tempdb	Online	Simple	Active Transaction	8.50 MB / 1.49 MB		No backup info found
Total (12 databases)				110.48 MB		

For SQL Server – 補充

Azure SQL Database

不支援

因缺少msdb

Demo

For Redis

Redis - 設定

```
{
   "Servers": [
     {
       "name" : "Domain or IP",
       "instances": [{
           "name": "隨意名稱",
           "port": "6379",
           "password" : "password"
         }]
     },
     {
       "name" : "Domain or IP",
       "instances": [{
           "name" : “隨意名稱",
           "port": "6379"
         }]
     }]
}
```

For Redis - Key

• 3 Standalones (All Masters)

Name	Host	Role	Slaves	Ops (/sec)	Memory (used)	Clients	Version	As of
Azure-Redis-Test	• opwu.redis.cache.windows.net (6379)	Master	0	973,872 (1)	1.84MB (36.48MB)	1	3.0.0	6s ago
[redacted]d	• redis.prod (6379)	Master	0	11,706 (0)	3.41MB (3.45MB)	13	2.8.17	0s ago
[redacted]A	• redis.qa (6379)	Master	0	466,309 (3)	40.66MB (40.69MB)	500	2.8.17	7s ago

• 1 Instance Group (4 instances) - Version 2.8.17

Name	Host (port - behind)	Role	Slaves	Ops (/sec)	Memory (used)	Clients	As of
M1	• 127.0.0.1 (6371)	Master	3	40,927 (2)	5.46MB (5.49MB)	3	5s ago
S1	• 127.0.0.1 (6372)	Slave	0	4,167 (0)	4.19MB (4.23MB)	5	0s ago
S2	• 127.0.0.1 (6373)	Slave	0	4,089 (0)	4.16MB (4.19MB)	3	1s ago
S3	• 127.0.0.1 (6374)	Slave	0	1,434 (0)	4.19MB (4.23MB)	5	5s ago

For Redis - Key

Redis: • opwu.redis.cache.windows.net: 6379 (Azure-Redis-Test) (View Raw) Poll Now

Summary	
Server	**opwu.redis.cache.windows.net:6379**
Name	**Azure-Redis-Test**
Version	3.0.0 (view config) (download)
Uptime	0
Role	Master
Slaves	0
Replication	No slaves or masters
SE.Redis Tiebreaker	not set
Clients	2

Stats	
Total Connections Received	613,366
Total Commands Processed	976,033
Current Operations per second	1
Key Hits	0
Key Misses	6,381
Key Expirations	0

Clients View All

Summary (by IP)

For Redis - DB

SE.Redis Tiebreaker	not set
Clients	2

Memory

Used	36.48 MB (38,249,552)
Used (Peak)	37.18 MB (38,990,512)
Used (RSS)	1.86 MB (1,949,696)
Used (Lua)	36.00 KB (36,864)
Fragmentation Ratio	0
Allocator	jemalloc-3.6.0

Persistence

Changes since last save	0
Last Save	一月 1 '70 at 0:00 (result: - 0)
AOF	disabled

Keyspace (8 keys)

DB	Keys	Expires
0 (analyze)	4	0
1 (analyze)	4	0

Clients View All

Summary (by IP)

118.163.107.187 (118-163-107-187)	2 connections

Summary (by name)

Opserver	2 connections

Slow Command Log View All

Command	Duration	When
ManagementCommand ? -1	170ms	yesterday
SUBSCRIBE __Booksleeve_MasterChanged	18ms	九月 20 at 4:26
GET __Booksleeve_TieBreak	33ms	九月 20 at 4:26
CLUSTER NODES	10ms	九月 20 at 4:26
ManagementCommand all	23ms	九月 19 at 23:46
ManagementCommand ? -1	59ms	九月 19 at 11:57
ManagementCommand getpublic	10ms	九月 19 at 11:45

For Redis – 分析

Memory Analysis of S1 (127.0.0.1:6372 - Database 0) - Runtime: 0 seconds - Run 28 secs ago

Re-run analysis

Key Pattern	Count	Bytes (Key)	Bytes (Value)	Bytes (Total)
Other (unrecognized)	5	28	10	38
A_starts	4	8	8	16
B_starts	3	6	6	12
Total	12	42.00 B	24.00 B	66.00 B

Top Keys (by Size) for S1

Category	Key	Bytes (Key)	Bytes (Value)	Bytes (Total)
Other (unrecognized)	set:3	5	2	7
A_starts	A4	2	2	4
B_starts	B3	2	2	4

Demo

For Exception

For Exception – 注意事項

- 符合 StackExchange 環境的 Error Handler
- 使用 StackExchange.Exceptional
  - 開源專案：GitHub, Nuget
  - 支援 Log to SQL Server & MySQL
  - 設定方式：程式設定, 資料庫設定

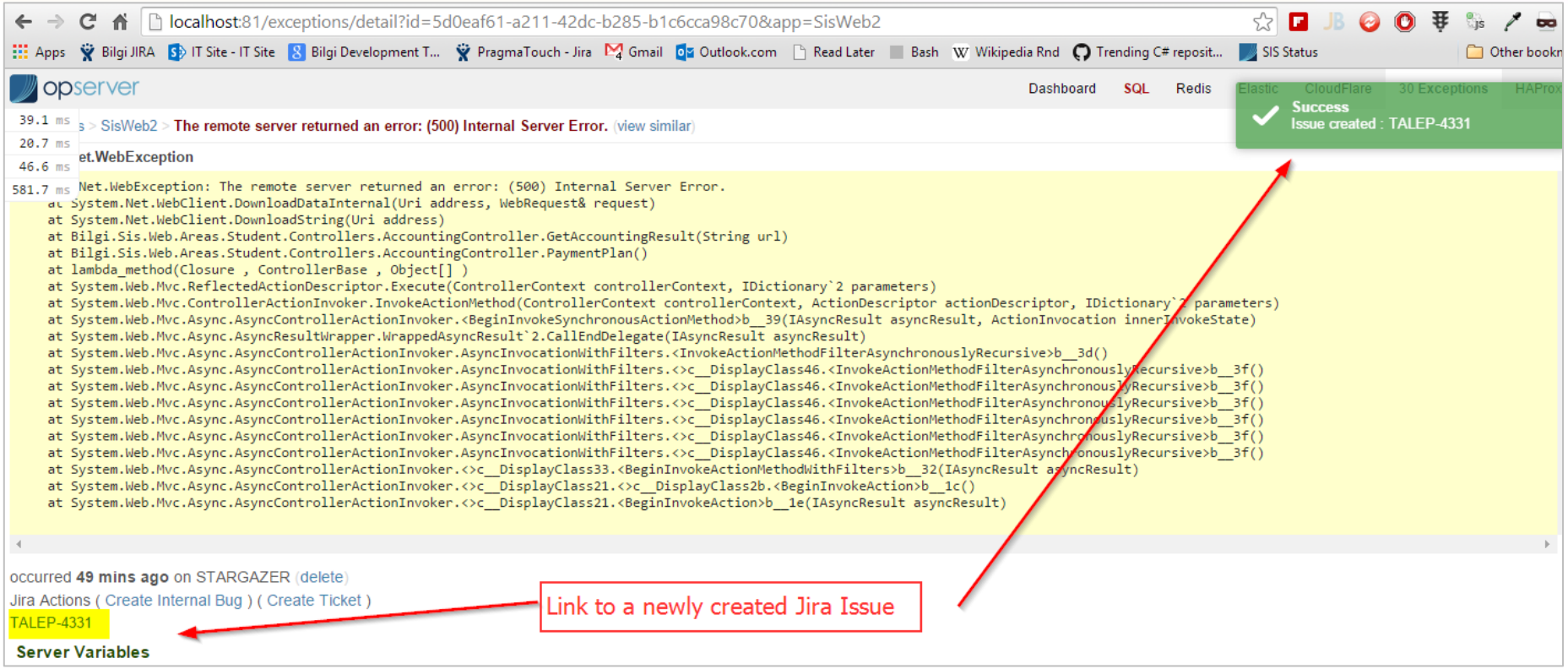
For Exception – 設定

```
{
      "warningRecentCount": "100",
      "criticalRecentCount": "200",
      "viewGroups": "",
      "applications": [
           "Samples.MVC4",
           "Samples.MVC5"
       ],
       "stores": [
           {
               "name": "AppExceptions",
               "queryTimeoutMs": 2000,
               "pollIntervalSeconds": 10,
               "connectionString" :  "資料庫連線"
           }
       ]
}
```

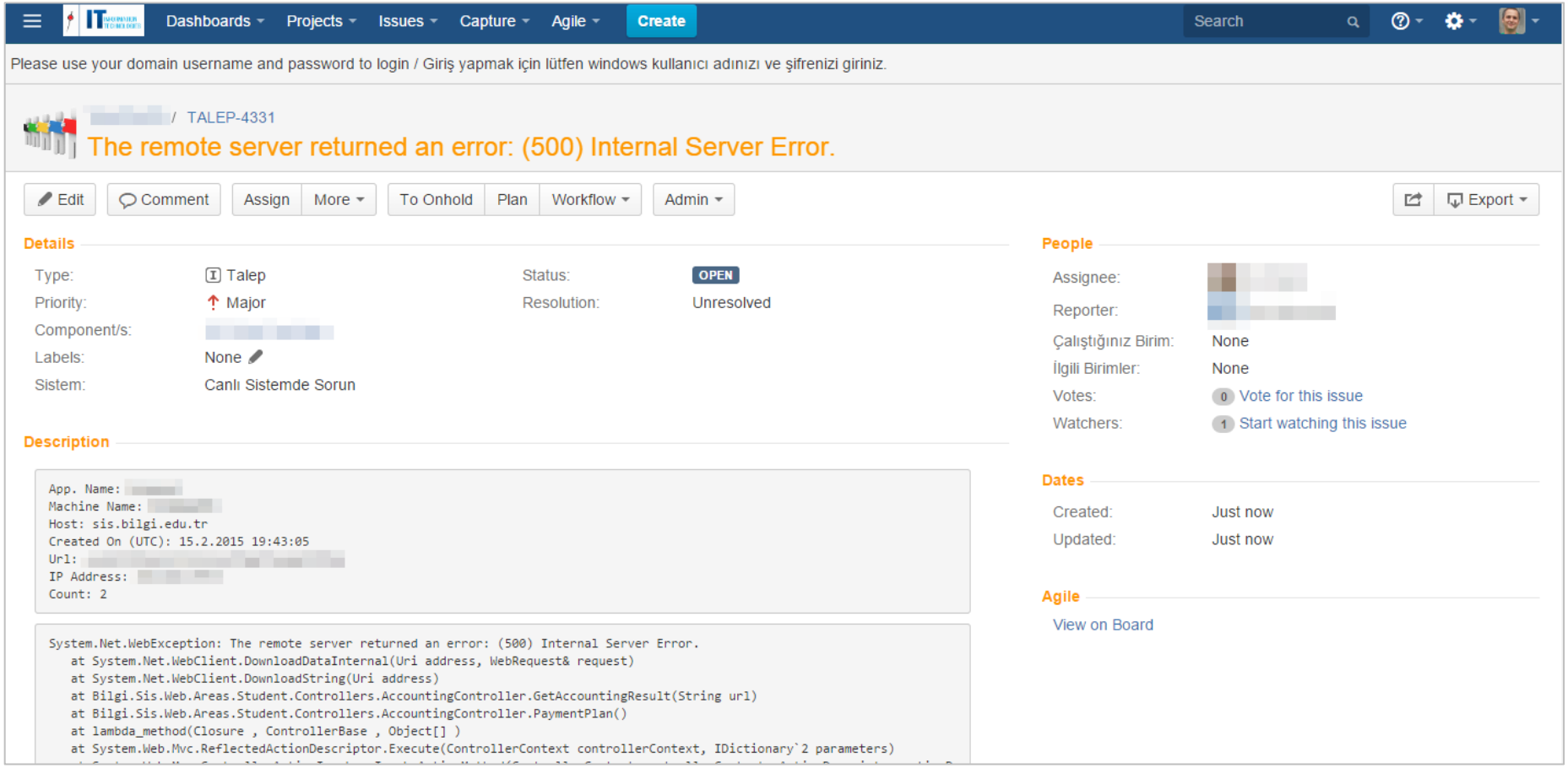
For Exception - Detail



For Exception - Jira



For Exception - Jira



Demo



其他

還有什麼沒說到的...

- Servers
- Elastic Search
- Haproxy
- Connect PagerDuty (IT Tool)
- Connect Jira
- Connect TeamCity (CI Tool)

補充資料

- Opserver.org
  - http://opserver.org
- Opserver GitHub
  - https://github.com/opserver/Opserver
- Stackoverflow 問題集
  - http://stackoverflow.com/questions/tagged/opserver

補充資料

- SQL CPU Graph 無法顯示 – 修正
  - https://github.com/opserver/Opserver/issues/93
- Pat Pack – 介紹設定方式
  - http://patpack.blogspot.tw/2013/10/setting-up-stackexchanges-opserver.html

謝謝聆聽~



最後...



感謝 KKTIX 贊助活動報名平台



http://kktix.com

感謝網際智慧贊助自然輸入法



感謝 Jetbrains 贊助贈品



ReSharper

https://www.jetbrains.com/resharper/

感謝 OzCode 贊助贈品



http://www.oz-code.com/

業界師資、實戰教學



http://skilltree.my

謝謝各位

http://mvc.tw

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