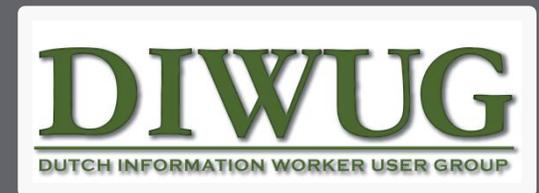


# Keeping your farm health: Logging, monitoring and throttling

Mirjam van Olst  
Macaw

# About Mirjam



- **Blog:** <http://sharepointchick.com>

- **Email:** [mirjam@macaw.nl](mailto:mirjam@macaw.nl)

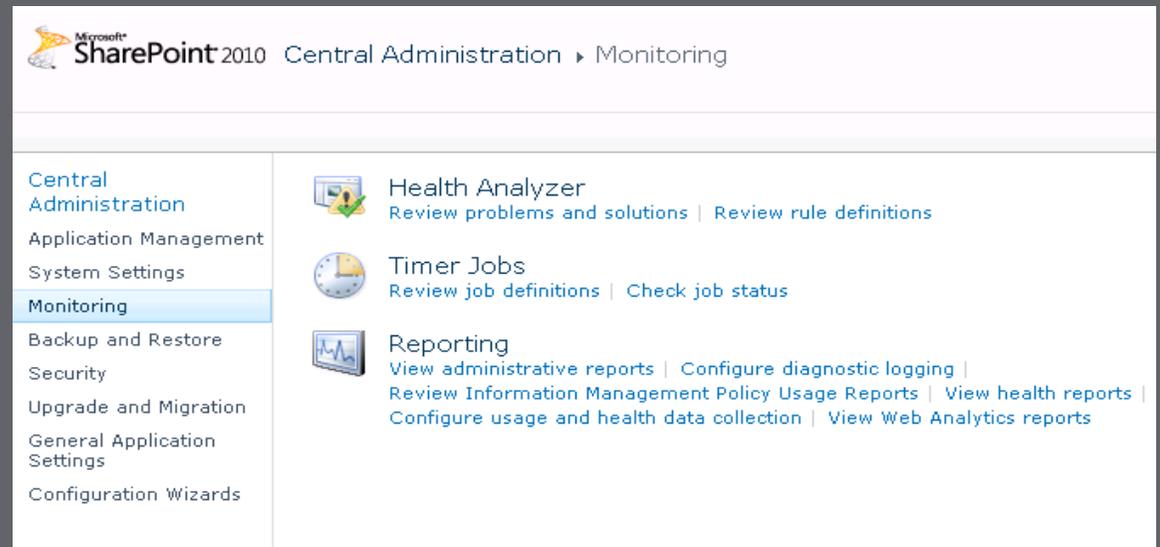
- **Twitter:** [@mirjamvanolst](https://twitter.com/mirjamvanolst)

# Agenda

- Logging and monitoring
- HTTP Throttling
- List Throttling

# Logging and monitoring features

- Diagnostic Logging
- Usage and Health data collection
- Logging database
- SharePoint Health Analyzer
- Web Analytics
- Reporting



The screenshot shows the Microsoft SharePoint 2010 Central Administration interface, specifically the Monitoring section. The breadcrumb path is "Microsoft SharePoint 2010 Central Administration > Monitoring". On the left, a navigation pane lists various administrative tasks, with "Monitoring" highlighted. The main content area displays three monitoring-related features: "Health Analyzer" (with a green checkmark icon), "Timer Jobs" (with a clock icon), and "Reporting" (with a line graph icon). Each feature includes links to further actions.

Microsoft SharePoint 2010 Central Administration > Monitoring

Central Administration  
Application Management  
System Settings  
Monitoring  
Backup and Restore  
Security  
Upgrade and Migration  
General Application Settings  
Configuration Wizards

 Health Analyzer  
[Review problems and solutions](#) | [Review rule definitions](#)

 Timer Jobs  
[Review job definitions](#) | [Check job status](#)

 Reporting  
[View administrative reports](#) | [Configure diagnostic logging](#) | [Review Information Management Policy Usage Reports](#) | [View health reports](#) | [Configure usage and health data collection](#) | [View Web Analytics reports](#)

# Diagnostic Logging

- Collect Event and Trace information
- Available in SharePoint 2007, but improved
- Data collection in
  - ULS Logs
  - Windows Event Logs

# Configure Diagnostic Logging

- Central Administration => Monitoring => Configure diagnostic logging
- Set event throttle level per category
- Enable event log flood protection
  - Will suppress repeating messages until conditions return to normal
  - Will prevent your event log from filling up with the same repeating event
  - By default messages will be suppressed if they occur more than 5 times in 2 minutes
  - You can use PowerShell to adjust this setting

# Configure Diagnostic Logging

## Event Throttling

Use these settings to control the severity of events captured in the Windows event log and the trace logs. As the severity decreases, the number of events logged will increase.

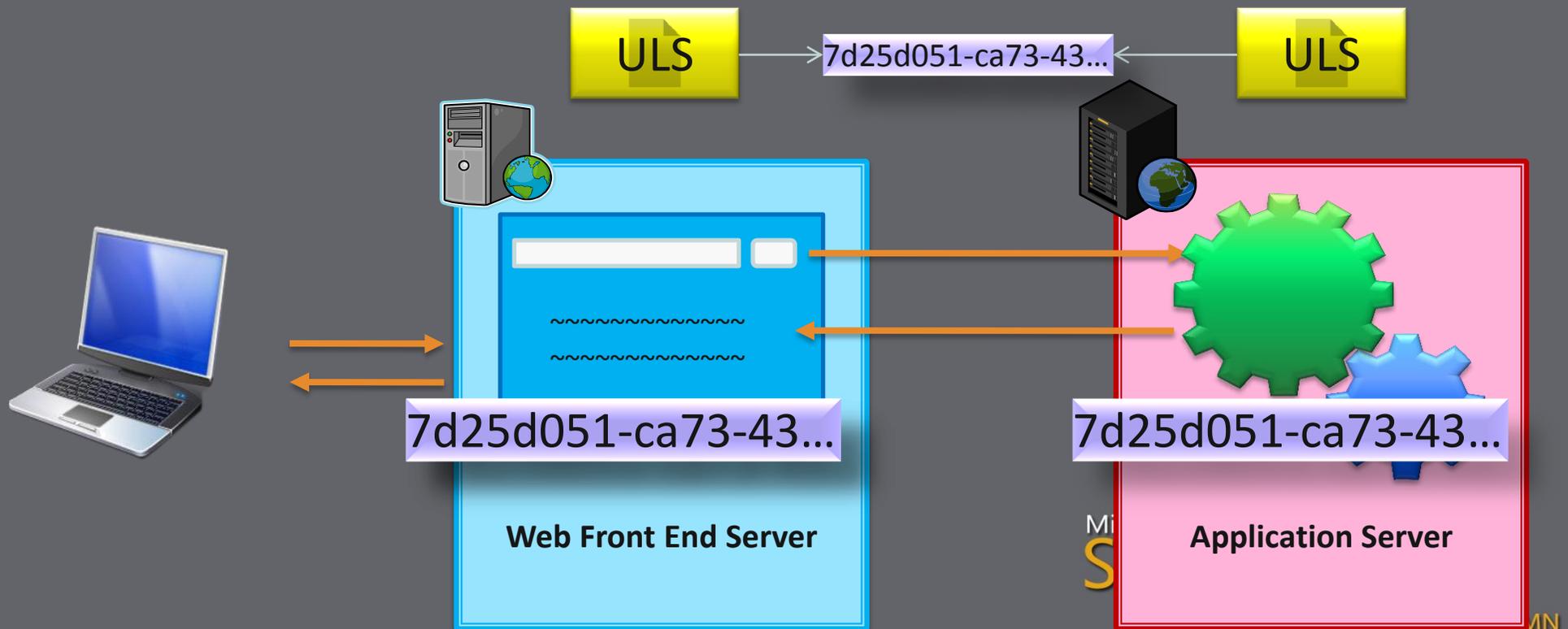
You can change the settings for any single category, or for all categories. Updating all categories will lose the changes to individual categories.

Select a category

Category	Event Level	Trace Level
<input type="checkbox"/> All Categories		
<input type="checkbox"/> Access Services		
<input type="checkbox"/> Business Connectivity Services		
<input type="checkbox"/> Business Data	Information	Medium
<input type="checkbox"/> Document Conversions		
<input type="checkbox"/> <b>Document Management Server</b>		
<input type="checkbox"/> Content Organizer	Information	Medium
<input type="checkbox"/> Document Conversions	Information	Medium
<input type="checkbox"/> Document Management	Information	Medium
<input type="checkbox"/> Document Sets	Information	Medium
<input type="checkbox"/> eDiscovery	Information	Medium
<input type="checkbox"/> <b>Information Policy Management</b>	<b>Warning</b>	Medium
<input type="checkbox"/> Records Center	Information	Medium
<input type="checkbox"/> Reporting	Information	Medium
<input type="checkbox"/> Workflow Features	Information	Medium
<input type="checkbox"/> eApproval		
<input type="checkbox"/> Excel Services Application		
<input type="checkbox"/> InfoPath Forms Services		
<input type="checkbox"/> PerformancePoint Service		
<input type="checkbox"/> Secure Store Service		
<input type="checkbox"/> SharePoint Foundation		

# Correlation ID

- From the start of a page request tracing is visible at every layer, even in SQL Profiler
- Filter by Correlation ID later to find the conversation



# Correlation ID

- If an error occurs:
  - Correlation ID surfaces in the browser in the popup
- If no error occurs
  - Correlation ID surfaces on the developer dashboard
- Being able to follow the conversation across layers and servers makes it a lot easier to find out what exactly happened during your request.

# Developer Dashboard

- Provides info about controls, queries and execution time during page render
- To write custom code output to the developer dashboard:
  - Execute your code in an OnInit or Render override
  - Wrap your code in a SPMonitoredScope block; can be setup to output to dashboard as well as ULS logs => best practice!
- Sandbox code never outputs to the developer dashboard

# Developer Dashboard

- Empower developers
- Ease the life of IT Pro's

**Developer Dashboard**

- Request (GET: http://sharepoint2-pc:80/SitePages/Home.aspx) (739.50 ms)
  - BeginRequestHandler (0.16 ms)
  - PostAuthenticateRequestHandler (0.02 ms)
  - PostResolveRequestCacheHandler (598.24 ms)
    - GetWebPartPageContent (579.49 ms)
      - GetFileAndMetaInfo (579.24 ms)
  - Wiki Edit OnInit (0.07 ms)
  - Wiki Edit OnInitComplete (34.29 ms)
    - Add WebParts (1.07 ms)
      - Shared Documents (0.94 ms)
  - Wiki Edit OnLoad (43.48 ms)
    - EnsureListItemsData (39.90 ms)
  - ToolbarMenuButton.CreateChildControls for SiteActions (0.29 ms)
  - ToolbarMenuButton.CreateChildControls for PersonalActions (0.10 ms)
  - IsCheckedOutToSystem (0.01 ms)
  - SPPageStateControl:OnLoad (0.09 ms)
  - Activate web part connections (0.02 ms)
  - Wiki Edit OnPreRender (0.12 ms)
  - DataBinding DataFormWebPart (Shared Documents) (38.00 ms)
    - EnsureListItemsData (31.45 ms)
  - SPPageStateControl:OnPreRender (0.14 ms)
  - Wiki Edit OnPreRenderComplete (0.05 ms)
  - Wiki Edit Render (10.05 ms)
    - Render Ribbon. (1.96 ms)

**Web Server**

Execution Time	740.42 ms
Current User	SHAREPOINT2-PC\paul
Page Checkout Level	Published
Current SharePoint Operations	1
Log Correlation Id	7ae46163-04ca-471c-aa65-28a1d24f5854

**Asserts and Critical Events**

**Database Queries**

proc_fetchDocForHttpGet	578.63 ms
dbo.proc_getObjectsByClass	32.81 ms
SELECT t1.[TimeCreated]	34.19 ms
DECLARE @DocParentIdForRF	29.40 ms
dbo.proc_getObjectsByClass	4.59 ms

**Service Calls**

**SPRequest Allocations**

SPWeb: http://sharepoint2-pc/SitePages/Home.aspx

**WebPart Events Offsets**

SPWebPartManager OnLoad	+0.00 ms
Shared Documents OnLoad	+0.13 ms
SPWebPartManager OnPreRender	+0.00 ms
Shared Documents OnPreRender	+41.04 ms

# Usage and Health data collection

- **Events to log:**
  - Content Import Usage
  - Content Export Usage
  - Page Requests
  - Feature Usage
  - Search Query Usage
  - Site Inventory Usage
  - Timer Jobs
  - Rating Usage
- **Logged to .usage files**
- **Microsoft SharePoint Foundation Usage Data Import timer job imports data from .usage files to logging database every 30 minutes**
- **Microsoft SharePoint Foundation Usage Data Processing timer job runs once very day to process the logged data**

# Usage and *Health* data collection

- Logged directly to logging database
- Uses a list of timer jobs
  - Diagnostic data provider timer jobs are disabled
  - Most resource intensive jobs:
    - Diagnostic Data Provider: Performance Counters - Database Servers
    - Diagnostic Data Provider: Performance Counters – Web Front Ends
  - These two timer jobs will extend the schema of the logging database and will log lots of data
  - If enabled logging database might require its own server

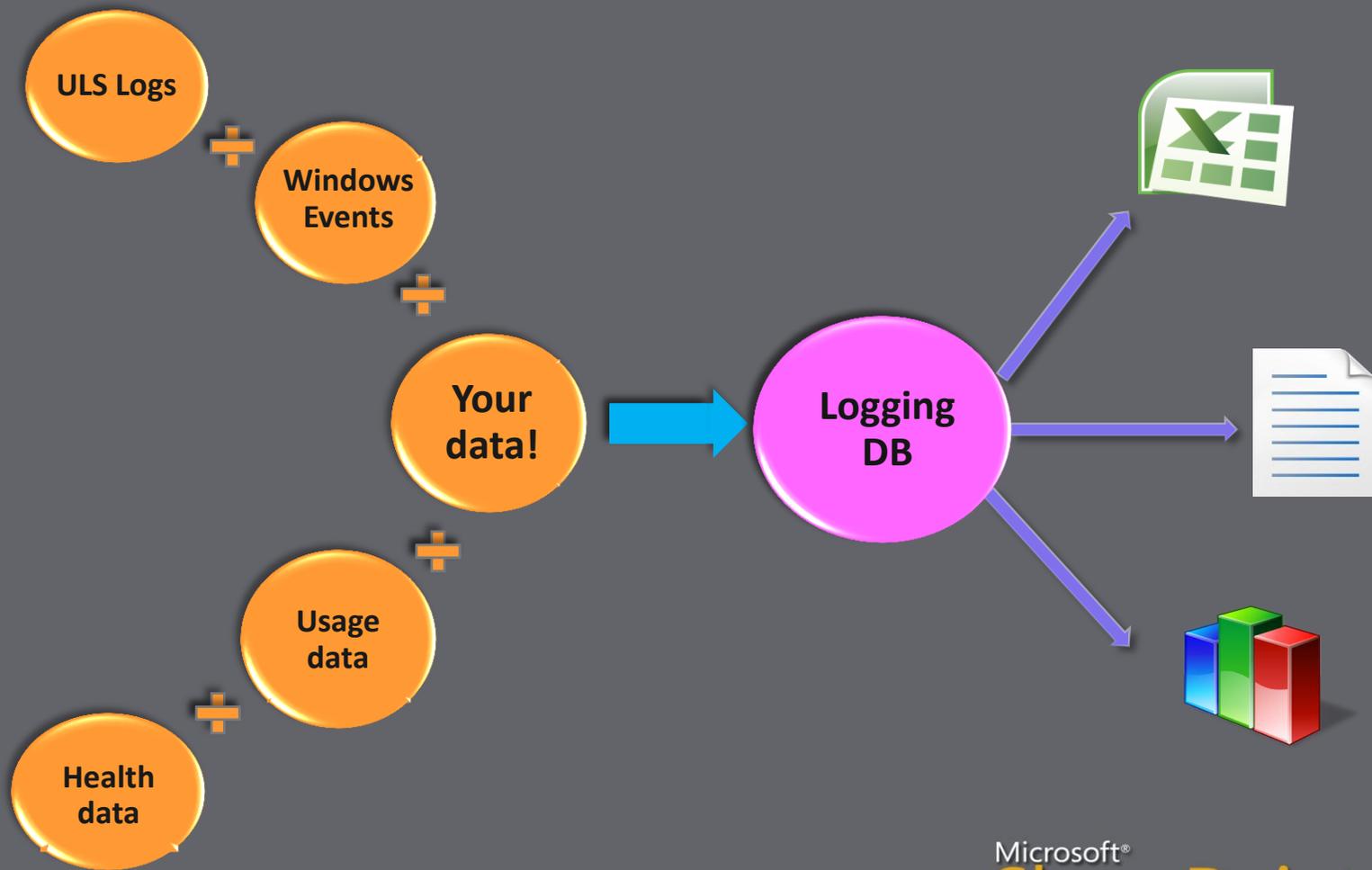
# Health data collection timer jobs

Title	Web Application	Schedule Type
Application Addresses Refresh Job		Minutes
CEIP Data Collection		Daily
Delete Job History		Weekly
Diagnostic Data Provider: Event Log		Disabled
Diagnostic Data Provider: Performance Counters - Database Servers		Disabled
Diagnostic Data Provider: Performance Counters - Web Front Ends		Disabled
Diagnostic Data Provider: SQL Blocking Queries		Disabled
Diagnostic Data Provider: SQL DMV		Disabled
Diagnostic Data Provider: SQL Memory DMV		Disabled
Diagnostic Data Provider: Trace Log		Disabled
Health Analysis Job (Daily, Microsoft SharePoint Foundation Timer, All Servers)		Daily
Health Analysis Job (Daily, Microsoft SharePoint Foundation Timer, Any Server)		Daily
Health Analysis Job (Hourly, Microsoft SharePoint Foundation Timer, All Servers)		Hourly
Health Analysis Job (Hourly, Microsoft SharePoint Foundation Timer, Any Server)		Hourly
Health Analysis Job (Monthly, Microsoft SharePoint Foundation Timer, Any Server)		Monthly
Health Analysis Job (Weekly, Microsoft SharePoint Foundation Timer, All Servers)		Weekly
Health Analysis Job (Weekly, Microsoft SharePoint Foundation Timer, Any Server)		Weekly
InfoPath Forms Services Maintenance		Daily
Password Management		Daily
Product Version Job		Daily

# Logging database

- Logging database = usage database
  - Don't get confused 😊
- Can be really busy and can get really big (TBs)
- Be selective about what to log!
- Could require it's own database server
- Uses partitioned tables
- Stores 14 days worth of data by default
- Can be extended to up to 31 days
- Changing the retention policy will empty all tables in the logging database
  - You will lose the data you collected up until that point

# Data in the logging database



# Logging database

- Schema is documented
- Write your own logging data to it
- Read, query, build reports directly from it
- Consider querying a snapshot to prevent locking
- You can even add tables or stored procedures!

```
declare @stime datetime
declare @etime datetime
set @stime = getDate() - 1
set @etime = getDate()
exec dbo.proc_GetSlowestPages
@StartTime = @stime,
@EndTime = @etime,
@WebApplicationId = 'd75c0a2e-2e15-4d1a-b300-7889fa86133f',
@MachineName = 'myshareointservername'
```

# SharePoint Health Analyzer

- New health analysis tool
- Enables you to proactively check for potential problems
  - Configuration
  - Performance
  - Usage problems
- Runs predefined health rules against all servers in the farm
- Health rule runs a test and returns a status
- SharePoint can sometimes help to resolve problems

# Health Monitoring Rules

- Health rules are custom assemblies
- They inherit from `SPHealthAnalysisRule` or `SPRepairableHealthAnalysisRule`
- They implement:
  - A `Check()` method: returns `Passed` or `Failed`
  - Some string properties that explain problems
  - Some categories (`ErrorLevel` and `SPHealthCategory`)
  - Optionally, a `Repair()` method: returns `Failed`, `Succeeded` or `Unnecessary`
- Uses the logs on the servers and the data in the logging database

# Maintaining Rules

- Registered rules go into config DB
- They are surfaced in the Health Analyzer Rule Definitions list in central admin
- You can modify properties of rules in that list:
  - Scope: All Servers or Any Server. For Any Server it runs on the first available server
  - Schedule: Hourly, daily, weekly, monthly or on demand
  - Enabled
  - Repair Automatically: if checked the Repair method is automatically called when the Check() returns Failed
- Adding a rule to this list doesn't implement a health rule
- A bug remains that lets you manually add entries to this list

# Health Monitoring Rules

<input type="checkbox"/> Title	Schedule	Enabled	Repair Automatically
<b>Category : Security (3)</b>			
Accounts used by application pools or service identities are in the local machine Administrators group.	Daily	Yes	No
Web Applications using Claims authentication require an update.	Daily	Yes	No
The server farm account should not be used for other services.	Weekly	Yes	No
<b>Category : Performance (10)</b>			
Application pools recycle when memory limits are exceeded.	Weekly	Yes	No
Databases used by SharePoint have fragmented indices.	Daily	Yes	Yes
Databases exist on servers running SharePoint Foundation.	Weekly	Yes	No
The paging file size should exceed the amount of physical RAM in the system.	Weekly	Yes	No
Databases used by SharePoint have outdated index statistics.	Daily	Yes	Yes
The timer service failed to recycle.	Weekly	Yes	No
Web Analytics: Monitors the health of the Report Consolidator component.	Daily	Yes	No
Web Analytics: Monitors the health of the Logging Extractor component.	Daily	Yes	No
Web Analytics: Monitors the health of the Data Analyzer Light component.	Daily	Yes	No
Web Analytics: Monitors the health of the User Behavior Analyzer component.	Daily	Yes	No
<b>Category : Configuration (30)</b>			
Alternate access URLs have not been configured.	Daily	Yes	No
The Application Discovery and Load Balancer Service is not running in this farm.	Hourly	Yes	No
Automatic Update setting inconsistent across farm servers.	Daily	Yes	No

# Reporting Problems

- Health rules are run by one of the many timer jobs whose name starts with “Health Analysis Job”
- Issues reported by health rules are surfaced in the Review problems and solutions list in central admin
- Includes an option to Reanalyze Now, which runs the rule again
- You can use normal list features like Alerts and RSS feeds to stay on top of reported health issues

# SharePoint Health Analyzer

Microsoft **SharePoint** 2010 Central Administration I Like It

The SharePoint Health Analyzer has detected some critical issues that require your attention. [View these issues.](#)

- Central Administration
- Application Management
- System Settings
- Monitoring
- Backup and Restore
- Security
- Upgrade and Migration
- General Application Settings
- Configuration Wizards

 **Application Management**  
Manage web applications  
Create site collections  
Manage service applications  
Manage content databases

 **Monitoring**  
Review problems and solutions  
Check job status  
View Web Analytics reports

 **Security**  
Manage the farm administrators group  
Configure service accounts

 **General Application Settings**  
Configure send to connections  
Configure content deployment paths and jobs  
Manage form templates

 **System Settings**  
Manage servers in this farm  
Manage services on server  
Manage farm features  
Configure alternate access mappings

 **Backup and Restore**  
Perform a backup  
Restore from a backup  
Perform a site collection backup

 **Upgrade and Migration**  
Convert farm license type  
Check product and patch installation status  
Check upgrade status

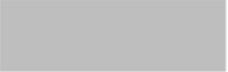
 **Configuration Wizards**

**Resources**

There are currently no favorite links to display. To add a new link, click "Add new link".

[+ Add new link](#)

# SharePoint Health Analyzer

<input type="checkbox"/>	Title	Failing Servers	Failing Services
<b>Category : Security (2)</b>			
	The server farm account should not be used for other services.		SPTimerService (SPTimerV4)
	Accounts used by application pools or service identities are in the local machine Administrators group.		SPTimerService (SPTimerV4)
<b>Category : Performance (1)</b>			
	Databases exist on servers running SharePoint Foundation.		SPTimerService (SPTimerV4)
<b>Category : Configuration (6)</b>			
	Missing server side dependencies.		SPTimerService (SPTimerV4)

# “Default” errors

- There will always be messages in the list of problems in the Review problems and solutions list
- “Missing server side dependencies”
  - Is looking for a dll that is apparently missing on the server out of the box, even if you installed everything the way it should be installed
- “The server farm account should not be used for other services”
  - Will popup if you are running the user profile service. This will by default use the farm account. There is no way around this, you can't change it, or your user profile synchronization won't work. You shouldn't use the farm account for any of the other services.

# Web Analytics

- Separate web analytics service application
- Has its own databases
  - Staging database
  - Reporting database
- Web Analytics doesn't write data to the logging database
- “Web Analytics Data Processing” timer job will collect data from the .usage files
- Usage data collection must be enabled for the web analytics service to work

# Web Analytics

<b>Database Server</b> Provide the name of the database server for this service application.	Server Name <input type="text" value="databaseservername"/>
<b>Staging Database Name</b> Provide a unique name for the Staging Database.	Database Name <input type="text" value="MyFarm_WA_Staging"/>
<b>Reporting Database Name</b> Provide a unique name for the Reporting Database.	Database Name <input type="text" value="MyFarm_WA_Reporting"/>
<b>Data Retention Period</b> Provide the data retention period for your Service Application. The value can range from 1 month to 25 months.	Data Retention <input type="text" value="25"/> 

# Reporting

- **Diagnostic logging:**
  - Surfaced in the ULS logs and in the Windows Event Logs.
  - Will mainly be used to track down the cause of problems on your environment and not necessarily to generate reports
- **Usage and health data:**
  - Stored in the logging database
  - Surfaced in reports on the view administrative reports and the view health reports pages

# Reporting

- **Health analyzer:**

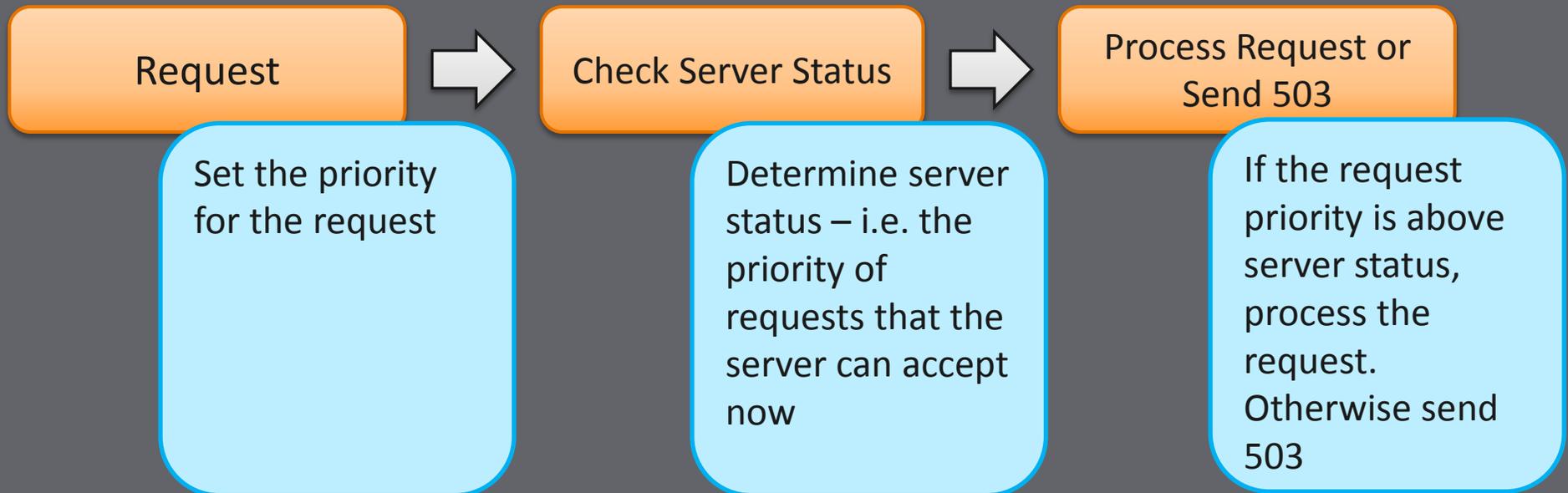
- Messages are stored in the Review problems and solutions list and in the Windows Event Viewer

- **Web analytics:**

- Reports are shown on the View Web Analytics reports page
- Web analytics reports show data collected per web application
- Go to the site settings pages for the following reports:
  - **Site Collection Web Analytics reports**
  - **Site Web Analytics reports**

# HTTP Request Throttling

- Refuses user requests when server is overloaded – allowing for more graceful degradation of service



# Request Types and Priorities

- **User Agent field used for prioritization**
  - Robot HTTP Requests
  - User HTTP Requests
  - Office client App User Requests
  - SOAP Robot Requests
  - SOAP User Requests
- **Request Priorities**
  - 1 = High (Potential Data Loss - Never Throttled)
  - 2 = Medium (Throttle me later)
  - 3 = Low (Throttle me first)

# HTTP Throttling Philosophy

- Requests that have already been received are processed normally!
- User initiated requests are always the last types of HTTP requests to be throttled.
- User initiated HTTP Puts are never throttled. We never want to refuse user data.
- When it is unclear on whether to throttle a request, the answer is “Prefer Throttling”. Our goal is to keep farms from going down.

# Client Sync Notification

- A client application can use the health score from the server to modify it's behavior
  - Office 2010 client applications do this
- Any client that is making an http request to the server will get back a health score
- It is added to the response headers collection X-SharePointHealthScore
- The worst score among all counters is returned
- The client may, or may not act upon the score

# List throttling

- Sets limits on how severely users can put the beat down on your servers
- Limits the amount of rows that can be retrieved for a list or library at any one time
- Example:
  - A list with thousands of items
  - A view that would return all items in the list
  - List throttling won't allow such a request to execute
  - User gets a message that his request exceeds the throttle limit for this list
  - Hit on the server is alleviated

# List throttling

- Examples of when list throttling will kick in:
  - Viewing data in a list or library
  - Sorting a large list on a non-indexed column
  - Deleting a web with large flat lists
  - When developing solutions while using for instance `SPList.Items` (depending on settings)

# List throttling - options

In Web Application general settings:

- List View Threshold –maximum number of items that can be retrieved in one request. Default: 5,000. Smallest: 2,000.
- Object Model Override –to enable retrieving items through the object model, up to the List view threshold for auditors and administrators
- List View Threshold for Auditors and Administrators –only relevant when Object Model Override is yes and only via the object model
- List View Lookup Threshold – only relevant for lookups
- Daily Time Window for Large Queries –block of time during the day when list throttling limits are not enforced

# List throttling exceptions

- **Daily Time Window (Happy Hour)**
  - Admin sets time when throttling not enforced
- **Each SPList has a property called EnableThrottling**
  - If false, list throttling is ignored for the list
  - Using object model SPList class
  - `SPList.EnableThrottling = False`
- **Box admin overrides all throttling**
  - Admin on the WFE server where request is received
  - Bypasses both regular and super user limits
  - Needs at least Read rights to the list data
  - Works in both browser and object model

# Configuring List Throttling

Resource Throttling

OK Cancel

**List View Threshold**  
Specify the maximum number of items that a database operation can involve at one time. Operations that exceed this limit are prohibited.

List View Threshold:

**Object Model Override**  
If you choose to allow object model override, users to whom you grant sufficient permission can override the List View Threshold programmatically for particular queries.

Allow object model override:  
 Yes  No

**List View Threshold for Auditors and Administrators**  
Specify the maximum number of items that an object model database query can involve at one time for users to whom you grant sufficient permissions through Security Policy.

List View Threshold for auditors and administrators:

**List View Lookup Threshold**  
Specify the maximum number of Lookup, Person/Group, or workflow status fields that a database query can involve at one time.

List View Lookup Threshold:

**Daily Time Window for Large Queries**  
Specify a daily time window when large queries can be executed. Specify a time outside of working hours for this window because large queries may cause excessive server load.

Enable a daily time window for large queries

Start time

Duration  hours

**List Unique Permissions**

# Demo

## List Throttling

# Your Feedback is Important

Please fill out a session evaluation form.

Thank you!