Keeping your farm health: Logging, monitoring and throttling

Mirjam van Olst

Macaw

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About Mirjam

- Blog: http://sharepointchick.com
- Email: mirjam@macaw.nl
- Twitter: @mirjamvanolst

Microsoft Certified Master

Microsoft MVP Most Valuable Professional

Macaw

DIWUG Dutch Information Worker User Group

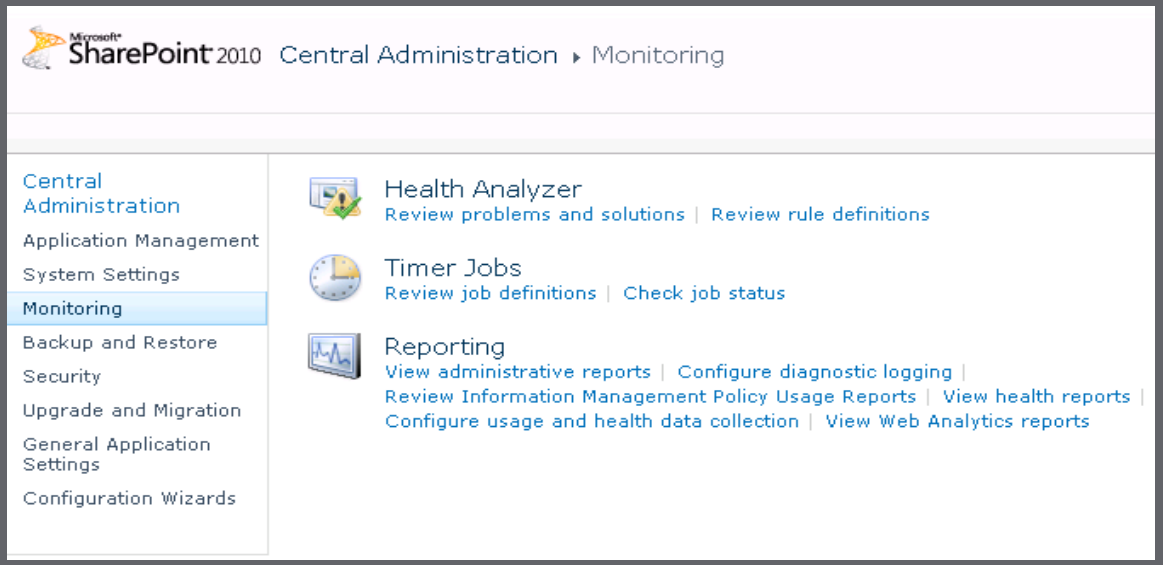
Microsoft SharePoint Connections 2010 Autumn

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



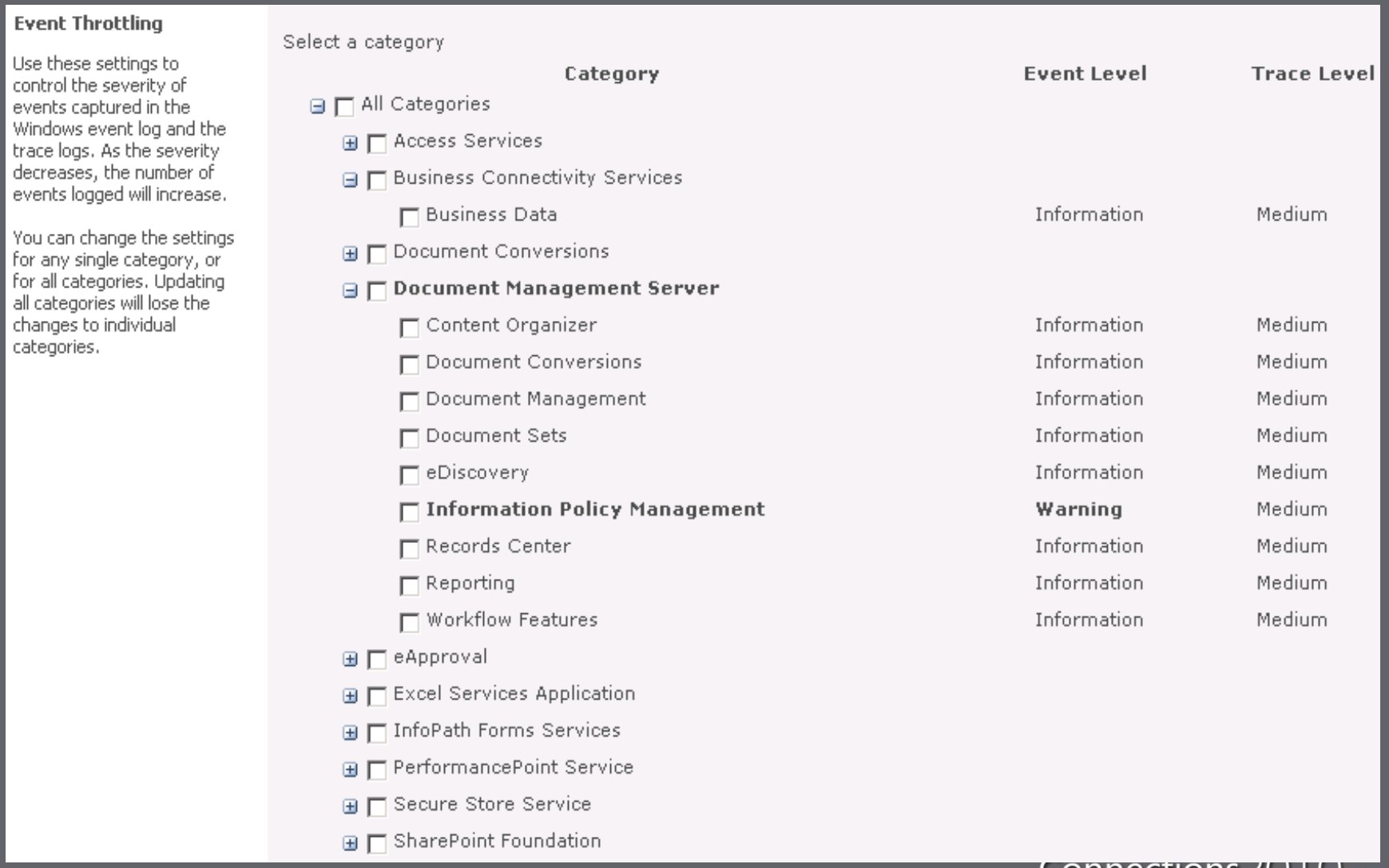
Diagnostic Logging

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

Configure Diagnostic Logging

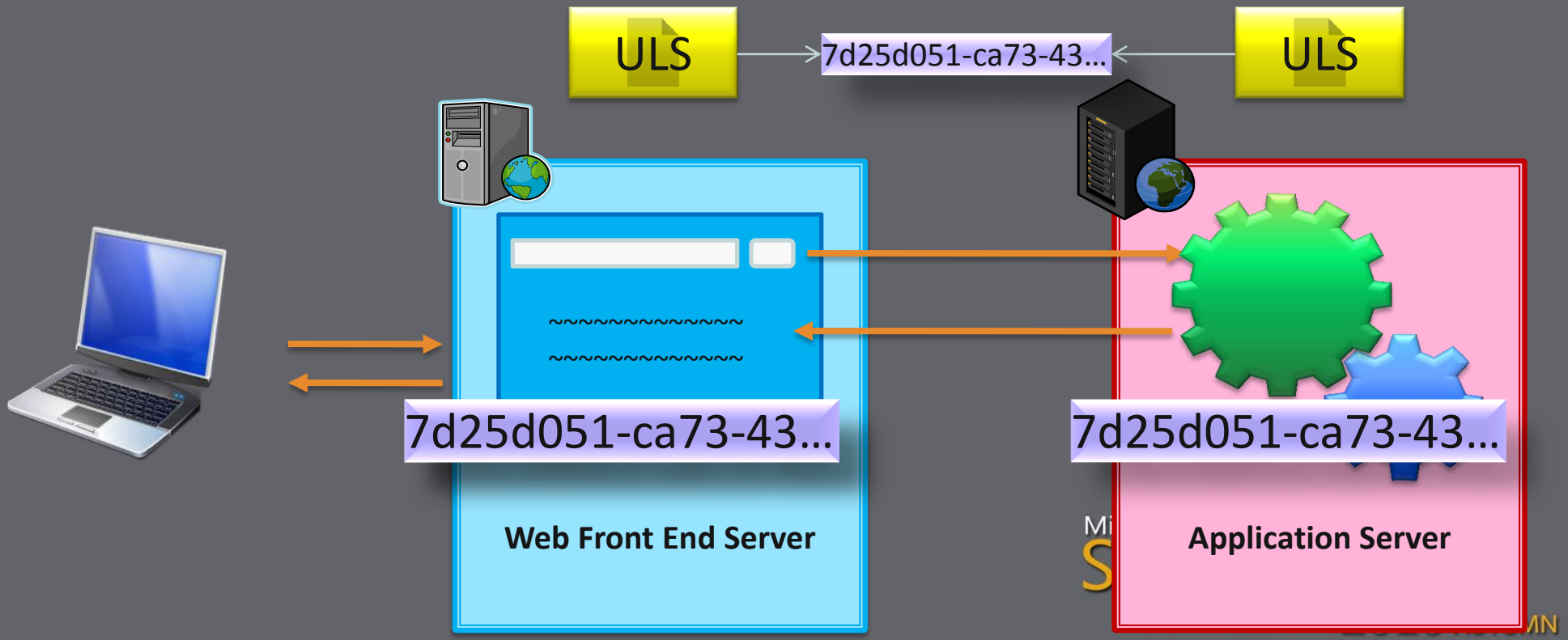
- Central Administration => Monitoring => Configure diagnostic logging
- Set event throttle level per category
- Enable event log flood protection
  - Will suppress repeating messages until conditions return to normal
  - Will prevent your event log from filling up with the same repeating event
  - By 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



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

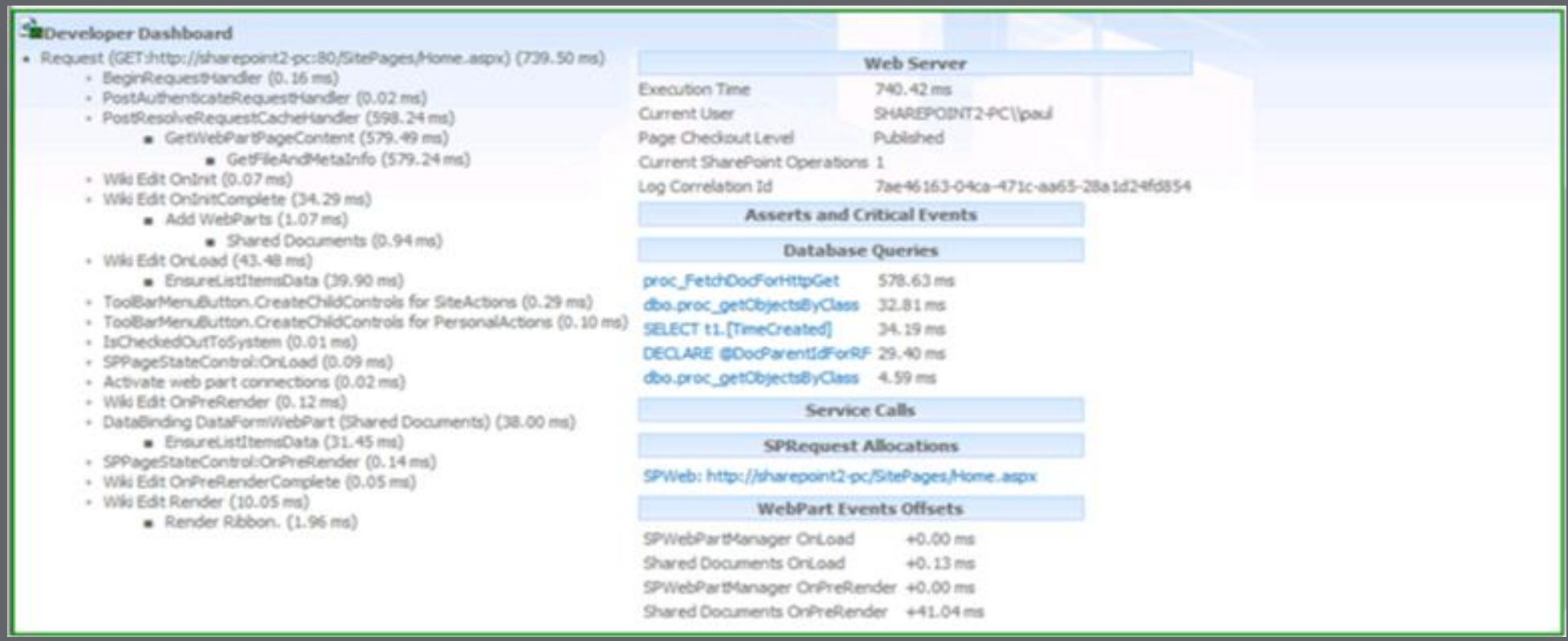
- If an error occurs:
  - Correlation ID surfaces in the browser in the popup
- If no error occurs
  - Correlation ID surfaces on the developer dashboard
- Being able to follow the conversation across layers and servers makes it a lot easier to find out what exactly happened during your request.

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



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

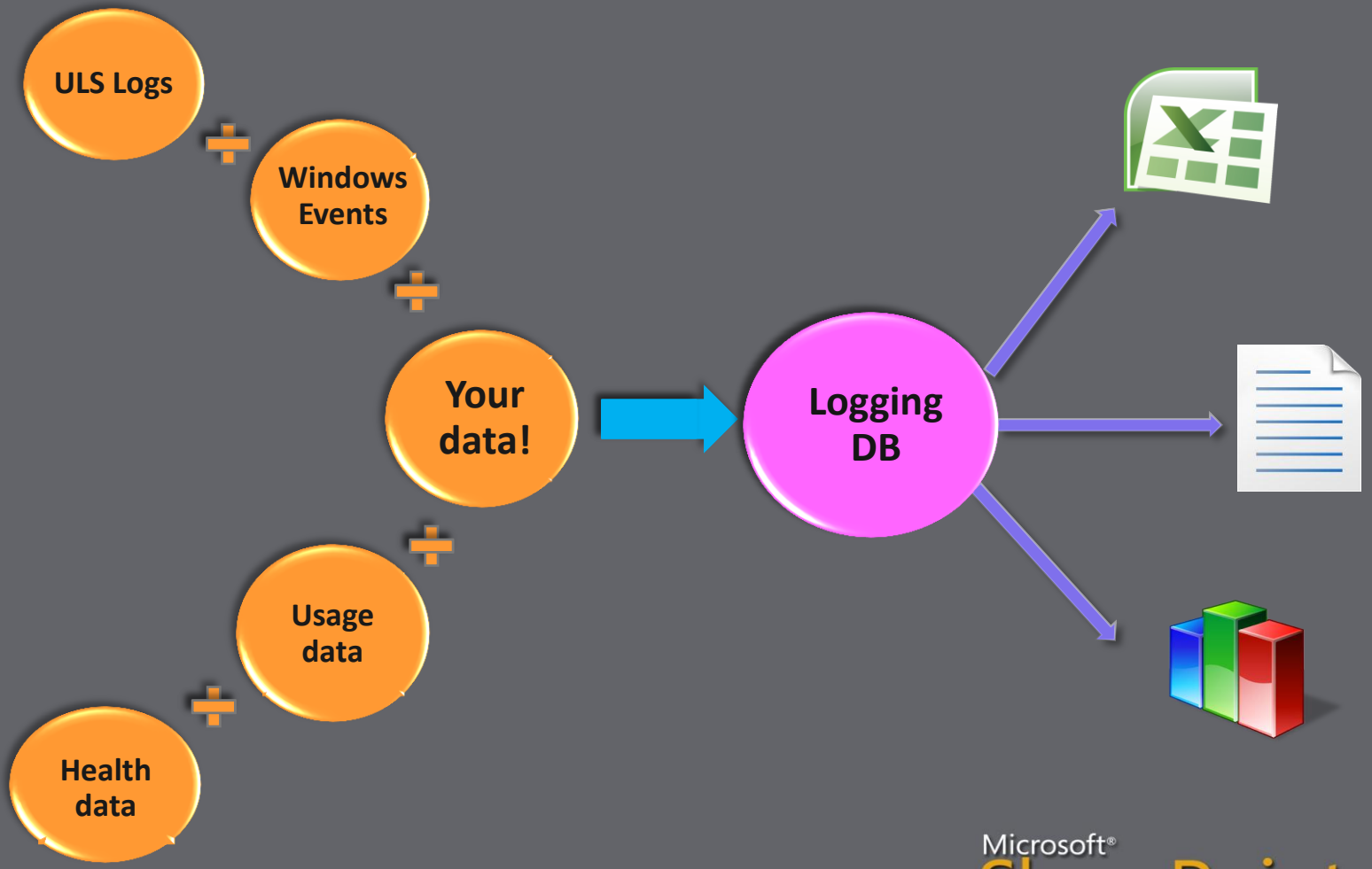
Service: Microsoft SharePoint Foundation Timer ▾ View: Service ▾

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

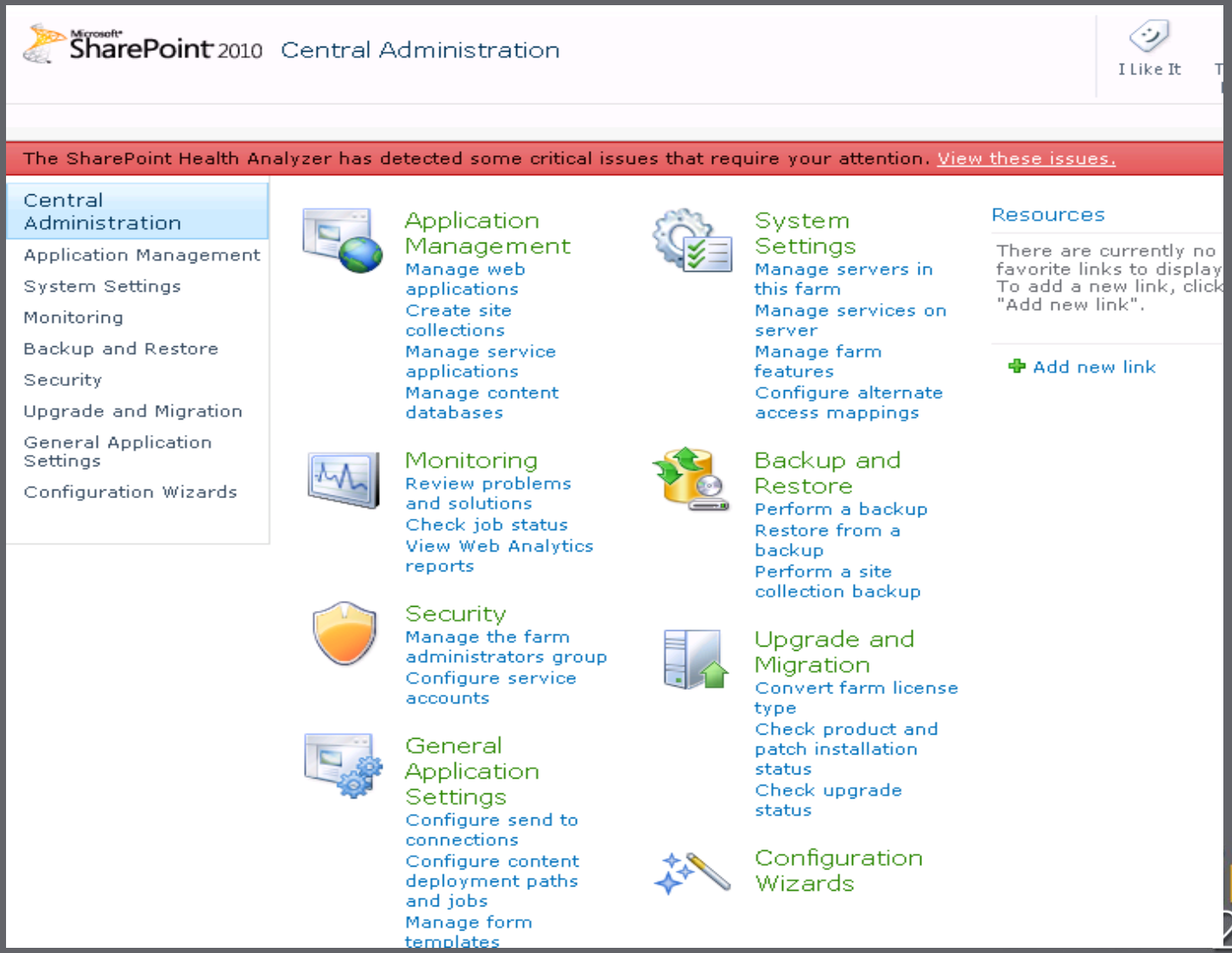
Health Monitoring Rules

Title	Schedule	Enabled	Repair Automatically
Category : Security (3)			
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
Category : Performance (10)			
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
Category : Configuration (30)			
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

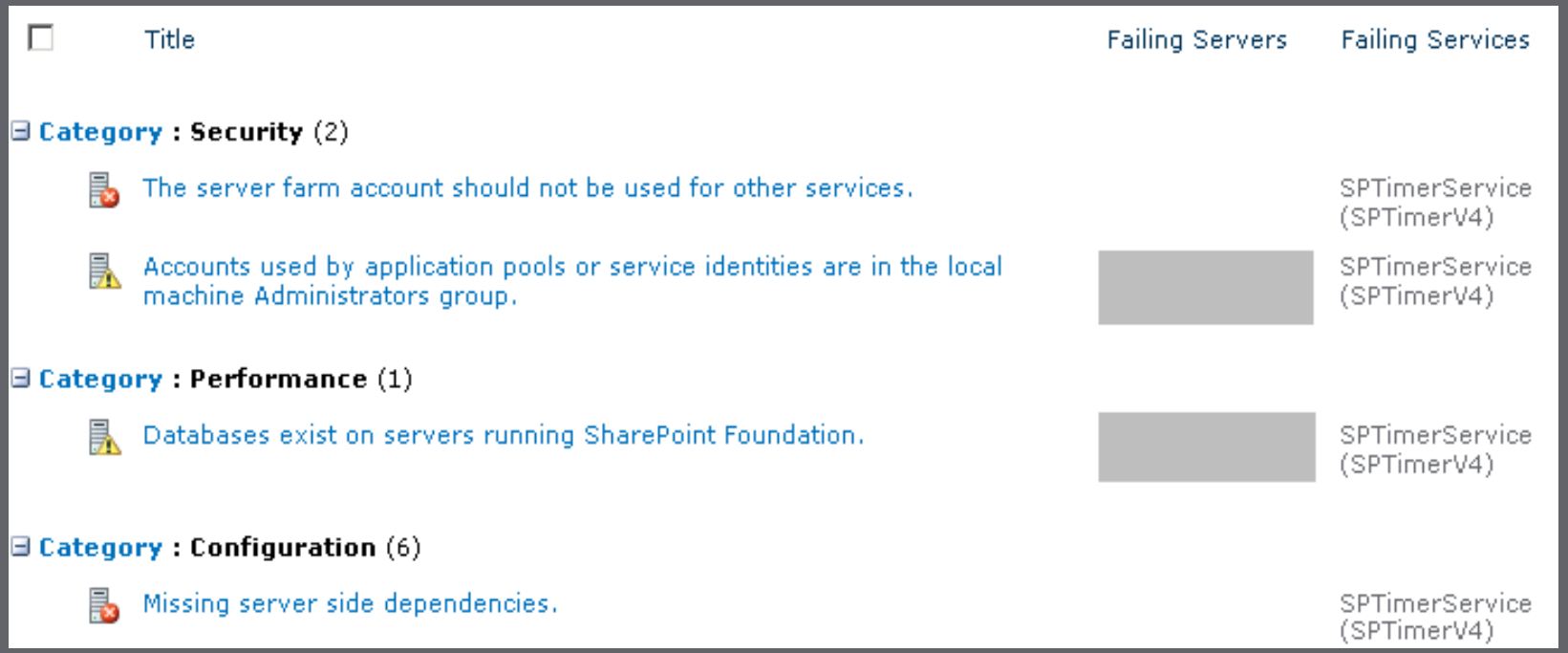
Reporting Problems

- 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



SharePoint Health Analyzer



Title	Failing Servers	Failing Services
Category : Security (2)		
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)
Category : Performance (1)		
Databases exist on servers running SharePoint Foundation.		SPTimerService (SPTimerV4)
Category : Configuration (6)		
Missing server side dependencies.		SPTimerService (SPTimerV4)

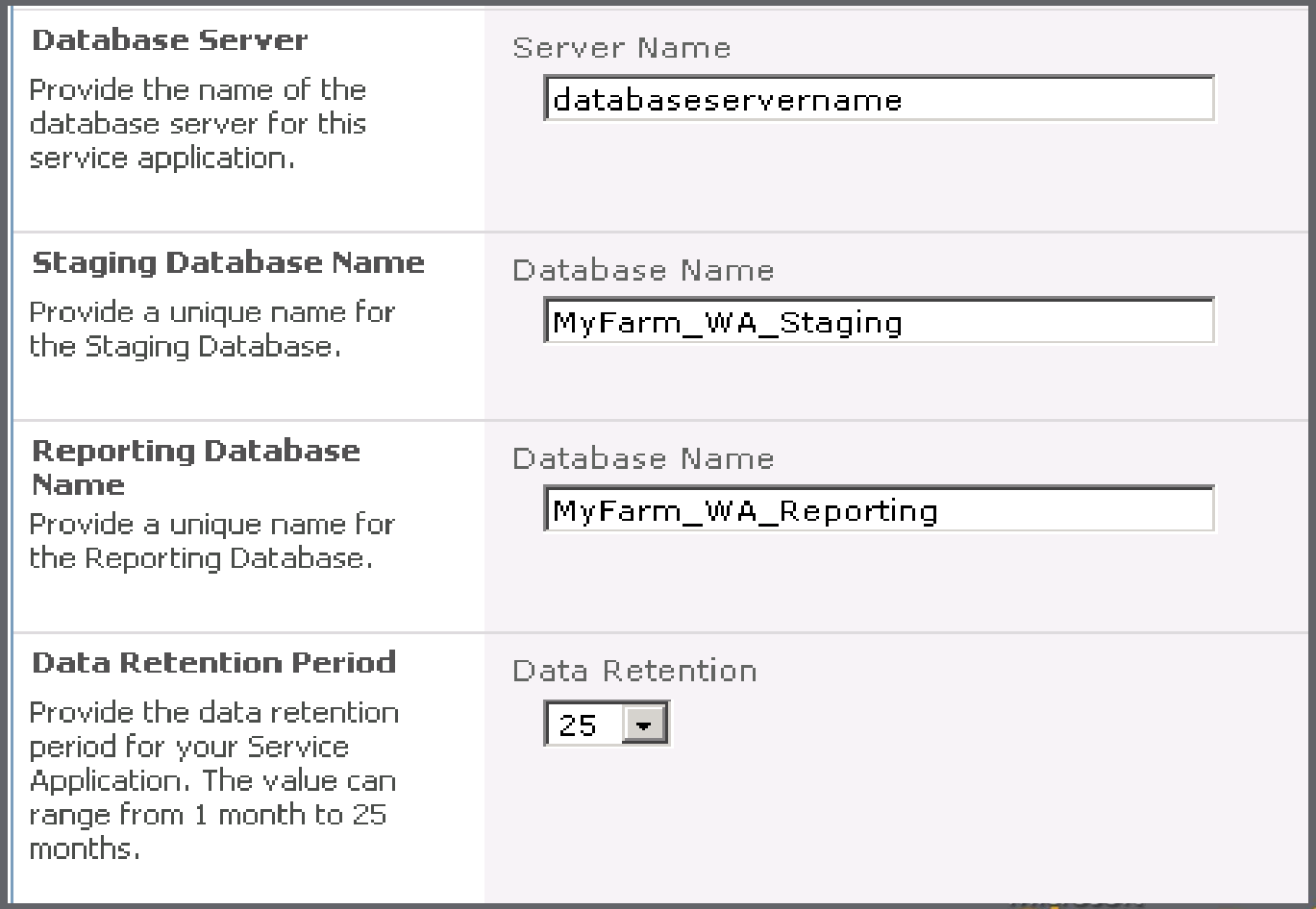
“Default” errors

- 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



Reporting

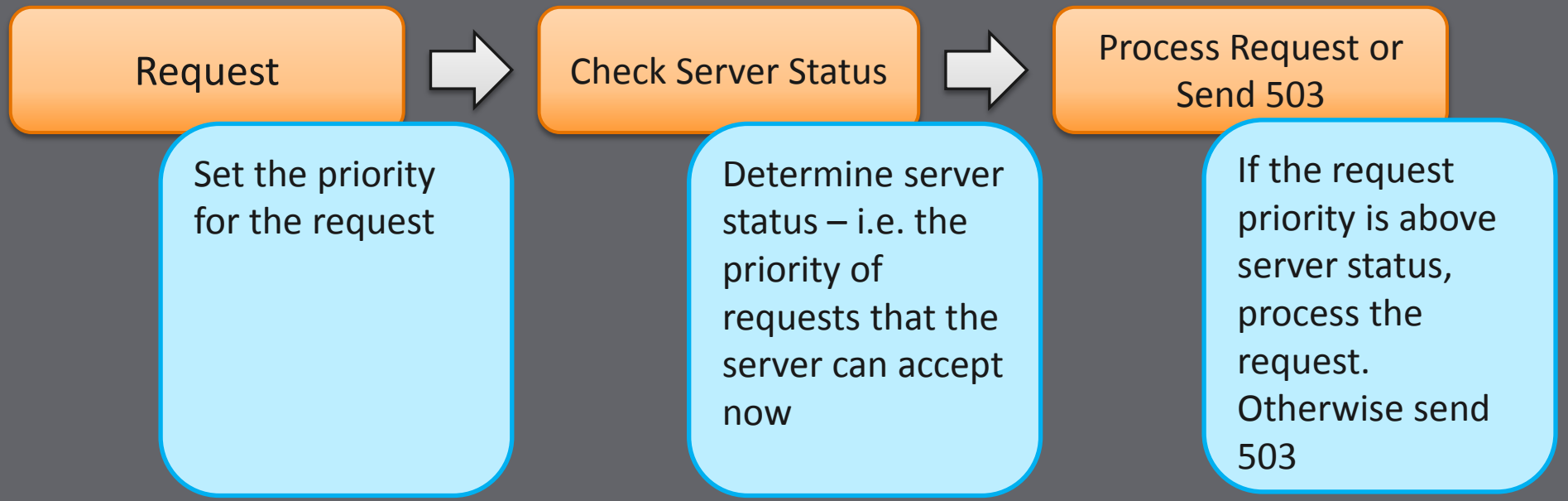
- Diagnostic logging:
  - Surfaced in the ULS logs and in the Windows Event Logs.
  - Will mainly be used to track down the cause of problems on your environment and not necessarily to generate reports
- Usage and health data:
  - Stored in the logging database
  - Surfaced in reports on the view administrative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

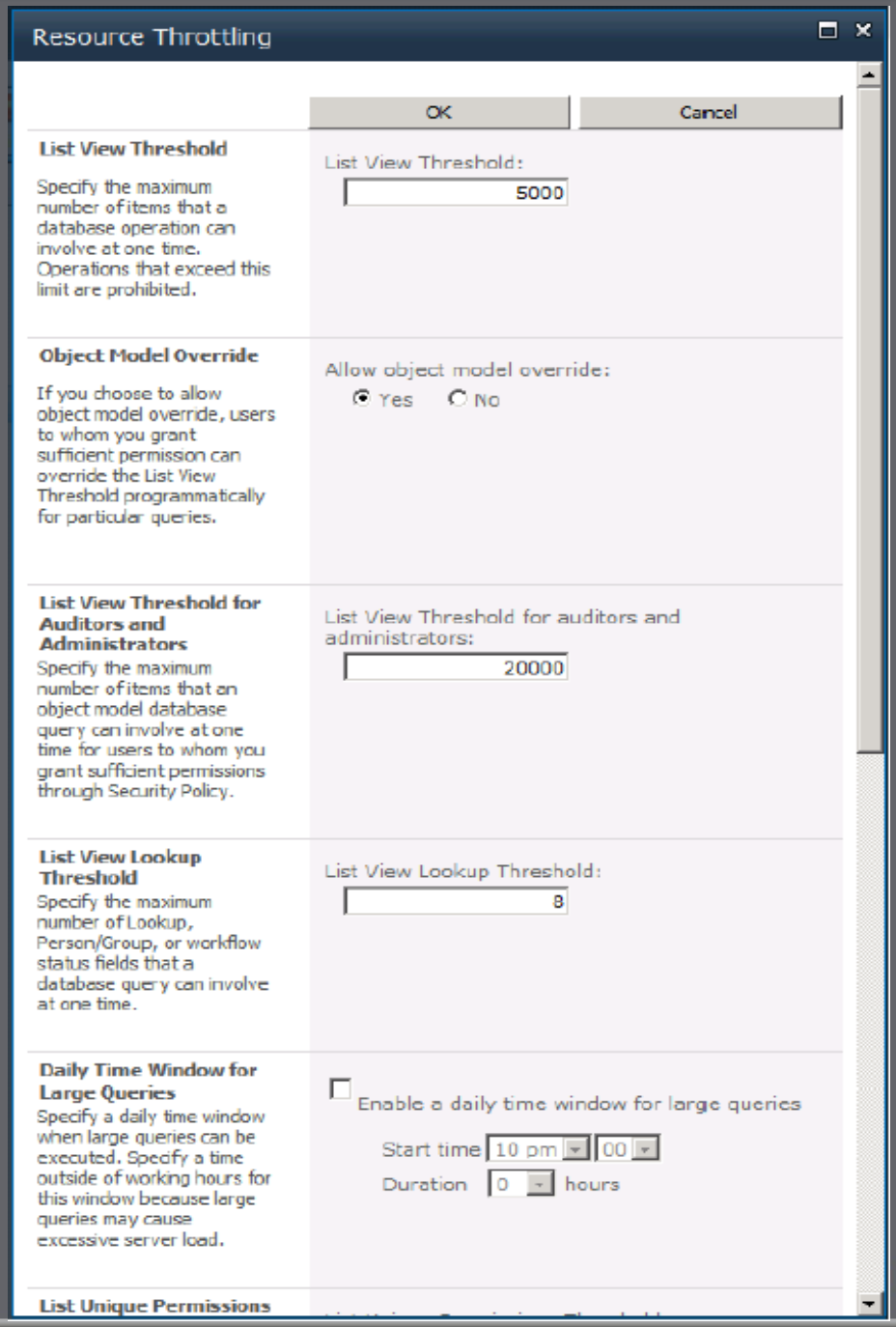
In Web Application general settings:

- 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



Demo

List Throttling

Your Feedback is Important

Please fill out a session evaluation form.

Thank you!

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