Scale-out Deployment of Operations Manager 2007 Web Interfaces

Configuring the Operations Manager Web Console and Reporting Server for Network Load Balancing

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Introduction

The documented configuration of the Web Console and Reporting components of Operations Manager 2007 provide no provision for deploying these components in a high availability configuration. However, by deploying the Web Console and Reporting components in a load-balanced web server farm, you can improve the availability and scalability of these components.

The Operations Manager 2007 Design Guide already provides documentation for high availability of other components, including:

- Cluster Root Management Server
- Cluster or mirror Operational DB and Reporting DB
- Configure agent communication failover to alternate Management Servers or Gateways

This document will bridge a gap by providing step-by-step guidance for configuring the Web Console and Reporting components of Operations Manager 2007 in a high availability configuration using hardware load balancing to support a web farm hosting multiple instances of each of these components. This is commonly referred to as a “scale-out deployment”.

The end result is an Operations Manager 2007 topology with redundancy throughout all components of the server infrastructure.
Scale-out deployment of Operations Manager web services

Scaling out the Operations Manager web console is much more a straight forward procedure than scaling out the Operations Manager Reporting Server. The following overview and the detailed description that follows are valid for this environment:

- Operations Manager 2007 SP1 (RMS installed)
- Windows Server 2003 (with IIS 6.0)
- SQL Server 2005 Enterprise Edition (for Operations Manager Reporting)
- Web console and Reporting may be hosted on the same web server farm

However; this configuration is not currently documented (and not officially supported) by Microsoft. Use caution when following the instructions in this document with, especially in production environments.

Figure 1 - Fully redundant and scaled out Operations Manager installation
## Configuration Overview for a Scale-Out Deployment

The table below lists the high level implementation steps required for a scale-out deployment of Operations Manager 2007 Web Interfaces. Detailed implementation steps are included later in the document.

<table>
<thead>
<tr>
<th>N°</th>
<th>Step</th>
<th>Web Console</th>
<th>Report Server</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Choose and configure load-balancing technology (page 9)</td>
<td>required</td>
<td>required</td>
<td>affinity / stickiness is required</td>
</tr>
<tr>
<td>b</td>
<td>Configure virtual DNS names (page 10)</td>
<td>recommended</td>
<td>recommended</td>
<td>preferably one for the web console and another one for the reporting server</td>
</tr>
<tr>
<td>c</td>
<td>Prepare windows service account (page 12)</td>
<td></td>
<td>required</td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>Issue SSL certificates for the virtual FQDNs (page 10)</td>
<td>optional</td>
<td>optional</td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>Install IIS (and ASP .NET) on the web nodes (page 13)</td>
<td>required</td>
<td>required</td>
<td>.NET 2.0 required on x64 set ASP .NET 2.0 as default</td>
</tr>
<tr>
<td>f</td>
<td>Install and patch SCOM Web console (page 13)</td>
<td>required</td>
<td></td>
<td>install only one web farm member server at one time</td>
</tr>
<tr>
<td>g</td>
<td>Prepare OpsMgr data warehouse database (page 15)</td>
<td></td>
<td>required</td>
<td></td>
</tr>
<tr>
<td>h</td>
<td>Install and base configure SQL Reporting Services (page 15)</td>
<td></td>
<td>required</td>
<td>SQL Server Enterprise Edition</td>
</tr>
<tr>
<td>i</td>
<td>Install OpsMgr Reporting Servers (page 19)</td>
<td></td>
<td>required</td>
<td>install only one web farm member server at one time</td>
</tr>
<tr>
<td>j</td>
<td>Configure SQL Reporting Services Name (page 20)</td>
<td></td>
<td>required</td>
<td></td>
</tr>
<tr>
<td>k</td>
<td>Configure ASP.NET MachineKey (page 21)</td>
<td>required</td>
<td>required</td>
<td></td>
</tr>
<tr>
<td>l</td>
<td>Backup SQL Reporting Services Encryption Key (page 22)</td>
<td></td>
<td>required</td>
<td></td>
</tr>
<tr>
<td>m</td>
<td>Configure IIS for load-balancing and SSL (page 23)</td>
<td>required</td>
<td>required</td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>Configure OpsMgr web addresses (page 26)</td>
<td>required</td>
<td>required</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 - Configuration steps for scale-out deployment
Licensing SQL Reporting Services for Scale-Out Deployment

Using SQL Reporting services in a web farm deployment has an impact on how the SQL Server components are licensed. The Reporting Servers have to be installed using SQL Server 2005 Enterprise Edition. See SQL Server 2005: Compare Features for more details.

You will have to acquire SQL licenses for the Reporting Services separately, as the Operations Manager Server 2007 with SQL Server Technology license only includes SQL Server Standard Edition. In a scale-out deployment, such a license covers the database servers which host the Operations Manager and the Operations Manager data warehouse database – if the servers are not being used by anything else but Operations Manager. However; for each reporting server in the web farm, an additional SQL Server 2005 Enterprise Edition license has to be purchased. SQL Server 2005: Special Licensing Considerations (Reporting).

Consider our example with two scaled out web farm member nodes. To fully license the three clusters and two web farm members you will need:

**Option A:** Operations Manager with SQL license

**Option B:** SQL licenses independent of Operations Manager

Figure 2 – Licensing Options
<table>
<thead>
<tr>
<th>Licenses required (Option A):</th>
<th>Licenses required (Option B):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>Operating System</td>
</tr>
<tr>
<td>• 6 x Windows Server Enterprise (cluster support)</td>
<td>• 6 x Windows Server Enterprise (cluster support)</td>
</tr>
<tr>
<td>• 2 x Windows Server Standard</td>
<td>• 2 x Windows Server Standard</td>
</tr>
<tr>
<td>Operations Manager</td>
<td>Operations Manager</td>
</tr>
<tr>
<td>• 1 x Operations Manager Server 2007 with SQL Server Technology</td>
<td>• 1 x Operations Manager Server 2007</td>
</tr>
<tr>
<td>• 6 x Enterprise Server ML (agent)</td>
<td>• 6 x Enterprise Server ML (agent)</td>
</tr>
<tr>
<td>SQL Server</td>
<td>SQL Server</td>
</tr>
<tr>
<td>• 2 x SQL Server Enterprise Edition (reporting)</td>
<td>• 2 x SQL Server Standard Edition (databases)</td>
</tr>
<tr>
<td></td>
<td>• 2 x SQL Server Enterprise Edition (reporting)</td>
</tr>
</tbody>
</table>

Table 2 – Licensing Option Details

This information has been extracted from the Microsoft web pages referenced above. There is no guarantee that it is still valid when you are reading this document. Please consult your Microsoft reseller before planning any purchases.
Preparation

A. Web Server Load-Balancing

In order to share the load in a web server farm, the incoming requests have to be distributed among the member servers. This could normally be achieved using DNS round robin, a dedicated network hardware solution or Windows Server Network Load Balancing.

Load-balancing an Operations Manager web interface requires affinity or stickiness. Since DNS round robin does not allow this, the only options are:

- Hardware Load Balancing (must support TCP port affinity)
- Microsoft NLB (affinity set)

Whichever approach you take: Make sure you talk to your network engineers beforehand, especially when considering the use of Microsoft NLB, which carries with it specific network configuration requirements.

**NOTE**: The web farm on the load balancer must be configured with affinity at layer 4 (TCP port). Once a client initiates a session, the load balancer must route all requests to the same web farm member node until the session is terminated. If the Otherwise the ASP.NET session state information becomes invalid.

Configuring layer 3 (IP) affinity is a common mistake that results in sessions being redirected to another web server prematurely.
B. DNS

I strongly recommend using DNS entries for the web server farm's virtual IP. This makes using the URLs much more user friendly. Examples in this article use:

- opsmgrcons.rburri.wordpress.com (web console)
- opsmgrrpt.rburri.wordpress.com (reporting)

C. SSL Certificates

If securing the web interfaces by forcing SSL communication is a requirement, a web server certificate for each virtual DNS name respectively IP address is required. The name of the SSL certificate must match the FQDN of the virtual IP.

The certificates are going to be shared among all farm member servers. Export the certificate including the private key to a .pfx file. Later on you will use this file to import the certificate on the web farm member nodes.

```plaintext
[NewRequest]
Exportable=True
KeyId=1024
MachineKeySet=True
ProviderName="Microsoft RSA SChannel Cryptographic Provider"
ProviderType=12
RequesterName="rburri"
SMIME=True
Subject="CN=opsmgrcons.rburri.wordpress.com"
[RequestAttributes]
CertificateTemplateName="WebServer"
```

**Table 3 - Web Server Certificate Request Template**

If the Certificate Authority issuing the certificates is not a member of the Microsoft Root Certificate Program, you need to ensure that the domain member servers trust the Certificate Authority. Check [Microsoft Knowledge Base Article 931125](https://support.microsoft.com/en-us/kb/931125) for a list of CAs and a hotfix which updates the list.
To make a non program member CA a trusted one, publish the CA's certificate chain to Active Directory. All domain member machines will then trust certificates issued by this CA. These steps require you to possess Domain Administrator in the root domain or Enterprise Administrator rights.

1. Obtain the Certificate Authority’s full certificate chain (.p7b file)

2. Double click the file, expand certificates and right click on each contained certificate to export it.

3. Publish the certificates to Active Directory. Repeat the following command for every certificate found in the chain. Begin with the top-level certificate

   CertUtil –dsPublish -f [CA Certificate File Name]

---

Figure 3 - Export individual certificates from a chain file
D. Service User Accounts (Operations Manager Reporting)

Operations Manager Reporting requires two service accounts. Create these two user accounts before beginning with the installation.

<table>
<thead>
<tr>
<th>Account</th>
<th>Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations Manager 2007</td>
<td><strong>Group Membership:</strong></td>
</tr>
<tr>
<td>Data Warehouse Reader</td>
<td>• Domain User</td>
</tr>
<tr>
<td></td>
<td><strong>Additional rights:</strong></td>
</tr>
<tr>
<td></td>
<td>• Log on as a batch job</td>
</tr>
<tr>
<td></td>
<td>• Log on as a service</td>
</tr>
<tr>
<td>Operations Manager 2007</td>
<td><strong>Group Membership</strong></td>
</tr>
<tr>
<td>Data Warehouse Writer</td>
<td>• Domain User</td>
</tr>
</tbody>
</table>

Table 4 - Operations Manager Service User Accounts

The data warehouse writer and reader accounts have to be domain users. Also make sure that the reader account gets granted the rights to ‘log on as a service’ and ‘log on as a batch job’. While the setup will initially take care of that, a domain security policy could remove these rights soon after. Check with your domain administrator.
Installation

E. Prepare the IIS servers
On each server which is going to be a member of the web farm, install .NET Framework 2.0, ASP.NET and IIS. Do not yet configure any IIS settings. The installation programs of the web console and reporting services work best when everything is still set to default values.

F. Installing Operations Manager Web Console
The Operations Manager web console can be run in two modes. Either the users authenticate using built in Windows authentication or they have to manually log in to the web console (forms authentication).

Using Forms Authentication (SSL) or not
If all web consoles user’s PCs are located in the same domain as the Operations Manager server installation, the integrated windows authentication may be used. Users will not be prompted for their credentials when accessing the web console. In that case trusted delegation has to be set up. See the note below. The linked document describes how to enable constraint delegation to the SDK and CFG account for the web console nodes.

With ‘Forms Authentication’, the users authenticate directly on the web server through a login page. In that case SSL has to be used. The huge advantage is that the web page can easily be accessed from computers not being members of the domain. Even publishing it on the internet is an option. Check System Center Forum: Publishing the Web Console to the Internet for background information.

This guide assumes Forms Authentication (with SSL) being used.

NOTE: It is possible to configure the Web Console to use Windows Authentication on a stand-alone Web Console server by configuring constrained delegation. For detailed configuration information, see the following article by Satya Vel.

Web Console Installation

If the Root Management Server is already in place then installing the web interface on each farm member node is a straight forward procedure. Just make sure that you do not attempt to install more than a single instance at a time as this might lead to some unexpected results. Do not forget to apply the Operations Manager hotfixes to all installed web consoles.

![Figure 4 - Installing Operations Manager Web Console](image)

If you plan to use your web servers for hosting Operations Manager Reporting Services as well, do not yet proceed with any IIS configuration steps. If not then continue with setting the ASP.NET machineKey on page 21).
G. Prepare Operations Manager Data Warehouse DB

The SQL server hosting the Operations Manager Data Warehouse Database might be shared with other databases if the database server can cope with the load. In that case you will have to use a separate SQL server license (see page 7 for more details). The SQL Reporting Services instances however can not easily be shared with other applications. The installation routine will most likely break already existing configurations since it integrates tightly with OpsMgr security.

1. Set up and patch the SQL Server which is going to host the Operations Manager Data Warehouse database (Standard Edition). Using x64 technology is a good choice.

2. Either using the installation wizard or DBCreateWizard.exe, create the initial OperationsManagerDW database on the SQL server. Do not install SQL Reporting Services or the Operations Manager Reporting Server on the database server.

![Figure 5 - Operations Manager Data Warehouse DB Setup using the setup wizard](image)

Choose SQL Server database instance, port and data files as required by the database server setup. When planning your installation, keep in mind that the data warehouse can grow quite large over time.
H. Install and Configure SQL Reporting Services

1. Proceed with installing SQL 2005 Reporting Services (Enterprise Edition) on the first web farm member node. Then configure the basic settings before installing the other nodes.

   - Install only Reporting Services (Report Manager and Shared Tools) and optionally from the Client Components the Business Intelligence Development Studio.
   - Leave the instance name set to ‘Default Instance’
   - At this stage do not require SSL communication
   - Use the built-in system account ‘Network Service’. This account will later be changed to the OpsMgr data warehouse reader account.
   - Choose ‘Install but do not configure the server’.

![Figure 6 - Microsoft SQL Server 2005 Reporting Services Setup](image)

2. Install SQL Server 2005 Service Pack (at least SP2)

3. Launch the Reporting Server Configuration Manager ‘RsConfigTool.exe’. Connect to the local SQL Reporting Services and configure/check the following settings:

   - Report Server Virtual Directory:
     Website: Default Web Site
     Virtual Directory: ReportServer
   - Report Manager Virtual Directory
     Website: Default Web Site
     Virtual Directory: Reports
   - Windows Service Identity
     Built-in Account: Network Service
- Web Service Identity
  
  ASP .NET Service Account: NT Authority\NetworkService
  Report Server: DefaultAppPool
  ReportManager: DefaultAppPool

  If the Web Service Identity shows a red state despite the values being correct, click on ‘Apply’.

- Database Setup
  
  Server Name: Connect to the SQL Server instance which is hosting the Operations Manager Data Warehouse.
  Database Name: Click on ‘New’ to create a new SQL Reporting Server database. Database Name: ReportServer (default). Do not select the option to create the database in SharePoint integrated mode.
  
  If the state icon remains red, click ‘Apply’

- Email Settings (optional)
  
  Sender Address: The sender email address for scheduled reports sent via email.
  SMTP Server: The SMTP server being used for sending emails

  Do not change SharePoint Integration, Execution Account or Initialization settings at this point.

---

![](image-url)

**Figure 7 - Reporting Services Configuration after the initial configuration**

4. Check that you can access the reporting services URLs without getting any errors:

- http://localhost/Reports
5. If this check is successful, repeat steps 3 to 5 on the other servers of the web farm. When configuring the Reporting Server Configuration Database Setup, connect to the already existing ‘ReportServer’ database instance.

6. After installing and configuring SQL Reporting Services on all member nodes, return to the Reporting Server Configuration of the first node.
   Select Initialization and join all the additional nodes to the web farm.

![Figure 8 - Joining farm members](image)

7. Now check that you can access the local reporting URLs on all member nodes:
   - http://localhost/Reports
I. Installing Operations Manager Reporting Server

Before installing the Operations Manager Reporting Server on the farm’s nodes, I strongly recommend backing up the OperationsManagerDW and ReportingServer databases as well as the individual farm member servers.

1. You should now stop the HealthService and the Config Service on the Root Management Server as it might lead to high load when installing several Reporting Servers in a short timeframe. Leave just the SDK Service running.

2. Continue with installing the OpsMgr Reporting Server (no data warehouse) on the first web farm member node using the installation wizard. You must be logged on as a member of the Operations Manager Administrators group.

![Figure 9 - Operations Manager Reporting Server Setup](image)

- **Connect to Root Management Server**: Enter the RMS’ name
- **Connect to the Operations Manager Data Warehouse**: instance hosting the data warehouse DB.
- **SQL Server Reporting Services instance**: Confirm the local server node
- **Data Warehouse Write Account**: Type username and password of the Data Warehouse Writer account
- **Data Reader Account**: Type username and password of the Data Warehouse Reader account

The installation may take very long. It integrates the SQL Reporting Services into OpsMgr’s security model and configures OpsMgr to use the data warehouse.
3. Repeat step two for each remaining node in the web farm. Do not attempt to install more than a single node at a time.

4. Apply hotfixes to all member servers.

5. Restart the Config Service and HealthService on the Root Management Server.

J. Configure SQL Reporting Services Host Name

When all OpsMgr reporting servers have been installed, proceed with configuring the SQL Reporting Services host name. For that purpose edit the RSWebApplication.config and RSReportServer.config files.

**RSWebApplication.config**

```xml
C:\Program Files\Microsoft SQL Server\MSSQL.[n]\Reporting Services\ReportManager

1. Edit `<ReportServerUrl>` to contain the FQDN including the virtual directory name (reportserver). Do not forget to add https:// respectively http://

2. Delete the entry (but not the tags) from `<ReportServerVirtualDirectory>`

![Figure 10 - RSWebApplication.config with VIP DNS name](image)

**RSReportServer.config**

```xml
C:\Program Files\Microsoft SQL Server\MSSQL.[n]\Reporting Services\ReportServer

1. Set the `<UrlRoot>` tag value to the same value as above.

![Figure 11 - RSReportServer.config with UrlRoot property set](image)

Repeat these steps for all farm member nodes. Restart the SQLReportingServer service at the end.
K. Configure ASP.NET MachineKey

To enable view state for the interactive HTML code of Operations Manager, the machineKey parameter has to be set in the web.config file in the OperationsManager and ReportManager directories.

The msdn article *How To: Configure MachineKey in ASP.NET 2.0* describes the steps to generate a valid MachineKey in details. For code weary: Several key generators can be found on the internet: e.g. developmentnow ASP.NET machineKey Generator.

1. **Web Console**
   - Generate an ASP.NET 2.0 machineKey
   - Edit the Web.config file in the web console's virtual directory (`C:\Program Files\System Center Operations Manager 2007\Web Console`), adding the `<machineKey>` tag inside the `<system.web>` section. Repeat this for every web server in the farm. The machineKey element must be identical for all of them.

2. **Report Server**
   - Generate another ASP.NET 2.0 machineKey
   - Edit the Web.config file found in the ReportManager directory (`C:\Program Files\Microsoft SQL Server\MSSQL.[n]\Reporting Services\ReportManager`). Again: Make sure the machine key is the same on all farm nodes.

```
<configuration>
  <configSections>
    <section name="MicrosoftWebControls" type="System.Web.ControlCollectionSection" requirePermission="false" precompliance="1" allowDefinition="always"巨大的">
      <sectionMisspelling mode="allow"/>
      <section name="WebServerControls" type="System.Web.WatsonCustomSectionsSection" requirePermission="false" precompliance="1" allowDefinition="always"/>
      <section name="RSCache" type="Microsoft.ReportingServices.CacheSection" requirePermission="false" precompliance="1" allowDefinition="always"/>
      <section name="UIConfig" type="Microsoft.ReportingServices.UIConfigSection" requirePermission="false" precompliance="1" allowDefinition="always"/>
    </configSections>
    <system.web>
      <defaultProxy enabled="false"/>
    </system.web>
    <machineKey validationKey="0B9B226BA3D0C8A0268F00538333B2" pages "validateRequest"="false"/>
    <compilation defaultLanguage="c#" debug="false"/>
    <customErrors mode="Off"/>
    <authentication mode="Windows"/>
    <identity impersonate="false"/>
    <trace enabled="false" requestLimit="10" pageOutput tracingState mode="InProc" cookieless="false" timeOut="0"/>
  </configuration>
```

*Figure 12 - Web.config file with machineKey tag*
L. Backup SQL Reporting Services Encryption Key

Some of the content of the SQL Reporting database is encrypted. I highly recommend saving a copy of the encryption key.

1. Launch the Reporting Server Configuration Manager ‘RsConfigTool.exe’ on any of the farm member servers. Connect to the local SQL Reporting Services and click on Encryption Keys.

2. Backup the Encryption Key to a file and store it in a safe place.

**Figure 13 - SQL Reporting Key Backup**

**NOTE:** Do not confuse this key with the Root Management Server encryption key. Keep a backup of both to be able to recover or migrate your data.
M. Configure IIS for load-balancing and SSL
To allow the IIS server to host the two web sites independently, some manual configuration is required. All steps need to be repeated on every farm member node.

Web Console
1. Open the Internet Information Services Manager (iis.msc)
2. From Web Sites, right click ‘Operations Manager 2007 WebConsole’ and choose properties
3. On the Web Site tab, click Advanced
4. In the Advanced Web Site Identification dialogue, configure the host header value of the web site to match your virtual IP’s FQDN. If SSL communication is required: Change the TCP port value to 51909 (this port will not be used for IIS communication later).
   Example: opsmgrcons.rburri.wordpress.com

![Figure 14 - IIS host header value configuration](image)

5. If SSL communication is required: Return to the web site properties and change to the Directory Security tab
6. In Secure communications, click Server Certificate. Import the certificate from the .pfx file or assign an already imported certificate. The certificate’s name must match the host header value. Set the SSL port to 51908 (the default port of the web console).
7. Back on the Directory Security tab; force the web site to only accept SSL communication. In Secure communications, click Edit. Tick ‘Require secure channel (SSL)’.
8. Apply all changes and close the web site property dialogue
Report Server

1. Open the Internet Information Services Manager (iis.msc)
2. From Web Sites, right click ‘Default Web Site’ and choose properties
3. On the Web Site tab, change the description. Choose a self-speaking name (e.g. ‘Operations Manager 2007 Reporting’)
4. On the Web Site tab, click Advanced
5. In the Advanced Web Site Identification dialogue, configure the host header value of the web site to match your virtual IP’s FQDN
   Example: opsmgrrpt.zburri.wordpress.com
6. If SSL communication is required: Return to the web site properties and change to the Directory Security tab
7. In Secure communications, click Server Certificate. Import the certificate from the .pfx file or assign an already imported certificate. The certificate’s name must match the host header value. Leave the SSL port at the default of 443.
8. Back on the Directory Security tab, you may force the web site to only accept SSL communication. In Secure communications, click Edit. Tick ‘Require secure channel (SSL)’.
9. Apply your changes and close the web site property dialogue
10. If SSL communication is required: Launch the Reporting Server Configuration Manager ‘RsConfigTool.exe’. Connect to the local SQL Reporting Services and click on Report Server Virtual Directory.

   1. Check ‘Require Secure Socket Layer (SSL) connections’
   2. Set Require for to ‘3 – All SOAP APIs’
   3. Set Certificate Name to the FQDN
      Example: opsmgrrpt.zburri.wordpress.com
   4. Click Apply

Figure 15 - SQL Reporting SSL Configuration
Check availability
Restart the IIS admin service on all member nodes.

You should now be able to access the URLs of the web console and the reporting server through the load-balanced virtual IP.

- http(s)://opsmgrcons.rburri.wordpress.com:51908
- http(s)://opsmgrrpt.rburri.wordpress.com/reportserver
- http(s)://opsmgrrpt.rburri.wordpress.com/reports

If you are having problems accessing any of the above URLs, refer to the troubleshooting section at the end of this document.
**N. Configure OpsMgr web addresses**

With all web interfaces functional, open the Operations Manager console. In the *Administration* pane, set the URLs to the virtual IPs’ FQDN for the web console and the reporting server.

1. In *Settings*, open the properties of *Reporting*. Set the URL value.
   
   Example: https://opsmgrpt.rburri.wordpress.com/ReportServer

2. Open Properties of *Web Addresses*. Set the URL value for the web console.
   
   Example: https://opsmrgcons.rburri.wordpress.com:51908/default.aspx

3. In *Security*, open User Roles. Add the user groups with access to Operations Manager reports to the *Operations Manager Report Operators* profile.

4. Restart the Operations Manager console.
Optional configuration steps

ASP.NET Application Pool Settings
Should the web console and reporting server only be used few times a day, the users might experience a delay during their first request to the applications. This happens because IIS by default recycles its application pools after 20 minutes of inactivity. Upon the first request, IIS will start a fresh worker process which will take some seconds.

The default IIS settings work fine when the applications see a mid to high use. If the web console and/or reporting server are not accessed often, consider the following configuration settings:

<table>
<thead>
<tr>
<th>Application pool property</th>
<th>Default setting</th>
<th>Low use setting</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recycle Worker Process (in minutes)</td>
<td>1740 (29 hours)</td>
<td>disable</td>
<td></td>
</tr>
<tr>
<td>Recycle worker process at the following times</td>
<td>none</td>
<td>daily during low use</td>
<td>Set different times on each farm member server</td>
</tr>
<tr>
<td>Shutdown worker process after being idle for (time in minutes)</td>
<td>20</td>
<td>disable</td>
<td>Leaving the default setting of 20 minutes, might lead to slow response when the users connect to the web applications for the first time</td>
</tr>
<tr>
<td>Maximum number of worker processes</td>
<td>1</td>
<td>1</td>
<td>Do not change this value. The applications will not work properly if it is increased.</td>
</tr>
<tr>
<td>Worker process must start within (time in seconds)</td>
<td>90</td>
<td>90</td>
<td>When using low performance servers, occasionally the application pool takes longer than 90 seconds to start (e.g. virtual lab machines). In that case increase the settings as required.</td>
</tr>
<tr>
<td>Worker process must stop within (time in seconds)</td>
<td>90</td>
<td>90</td>
<td></td>
</tr>
</tbody>
</table>

Table 5 - IIS Application Pool Settings

To change the default application pool settings (affects all application pools):

1. Open the Internet Information Services Manager (iis.msc)
2. Right click on Application Pools and choose Properties
3. Set the appropriate values on the Recycle and Performance tabs
Custom Images and Logos
Adding company logos to the web console and the reports is achieved by replacing the original images by you’re the ones of your choice. It is important not to change the size, format and file name of the images. The following lists contain images which are goof candidates for customization.

Web Console Images
To change the web console’s default images, simply replace the original files in the image location folder with the custom ones. Repeat this step on every web farm member node.

<table>
<thead>
<tr>
<th>File Name</th>
<th>Image Location</th>
<th>Size</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>log_in.png</td>
<td>C:\Program Files\System Center Operations Manager 2007\Web Console\Images</td>
<td>574 x 448</td>
<td>Background picture of the web console’s log in screen (forms authentication)</td>
</tr>
<tr>
<td>header_back1.png</td>
<td>C:\Program Files\System Center Operations Manager 2007\Web Console\Images</td>
<td>896 x 43</td>
<td>Upper right header background of the web console</td>
</tr>
</tbody>
</table>

Table 6 - Customizable Web Console images
Reporting Server Images
Replacing Reporting Server’s default images requires not only copying them to the image location folder but also replacing them in the reporting server database:

1. Copy the altered images to the image directory on all web farm member nodes.
2. Access the reports URL in Internet Explorer (https://opsmgrsrpt.rburri.wordpress.com/Reports)
3. Click Upload File and load the customized images. You must check Overwrite item if it exists

<table>
<thead>
<tr>
<th>File Name</th>
<th>Image Location</th>
<th>Size</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>banner_landscape.jpg</td>
<td>C:\Program Files\System Center Operations Manager 2007\Reporting\Reports</td>
<td>1013 x 62</td>
<td>Header of landscape reports</td>
</tr>
<tr>
<td>banner_portrait.jpg</td>
<td>C:\Program Files\System Center Operations Manager 2007\Reporting\Reports</td>
<td>772 x 62</td>
<td>Header of portrait reports</td>
</tr>
</tbody>
</table>

Figure 18 - Replace Report Server banner images

Table 7 - Customizable Web Console images
Redirect Report Server Default Home Page

When using Internet Explorer to browse the Operations Manager Report Manager web interface, the URL used is http(s)://[servername]/Reports. When users access the web server without specifying the Reports virtual directory, they will see the default IIS start up page. Redirecting the default home page for the web server will ensure that the user is always taken to the Report Manager virtual directory.

1. Open the Internet Information Services Manager (iis.msc)
2. Right click on Operations Manager 2007 Reporting web site and choose Properties
3. Change to the Home Directory tab
4. Click A redirection to a URL
   - In Redirect to: type /reports
   - Check A directory below URL entered

![Figure 19 – Reporting Server Home Directory redirection](image_url)
Common Problems
This section lists commonly seen issues when installing the Operations Manager web interfaces and explains how to solve them.

Error Message when using a web browser to access the web interfaces

- The underlying connection was closed: Could not establish trust relationship for the SSL/TLS secure channel.
  
  **Solution:** Check that the SSL certificates’ name matches the value entered in Reporting Server Configuration Manager / Report Server Virtual Directory

- Server Error: The current identity ([user]) does not have write access to ‘[path]\Temporary ASP.NET Files’.
  
  **Solution:** Grant the user Write and Execute access on the folder that the error message indicates.

- Server Error on ‘[application path]’: Configuration Error
  Or
  Server Application Unavailable
  Or
  The XML page cannot be displayed: Cannot view XML input using XLS style sheet.
  
  **Solution:** Opening Internet Information Services Manager (iis.msc), check that ASP.NET version is set to 2.0 (and not 1.1) for the Web Site and/or Virtual Directory affected.
Problems with the link contained in scheduled reports

- Scheduled Reports containing the link to the report do not point back to the virtual server IP name.

**Solution:** Check RSReportServer.config: C:\Program Files\Microsoft SQL Server\MSSQL.[n]\Reporting Services\ReportServer. The <UrlRoot> tag value must match the VIP DNS name.

- The link in scheduled reports point back to the correct URL but you receive the following error message: *An internal error occurred on the report server. See the error log for more details. (rsInternalError)* Get Online Help Object reference not set to an instance of an object.

**Explanation:** Unfortunately this behaviour is expected: KB 949454. The URL text length for Reports requiring too many parameters to run exceeds the maximum length set in the SQL Reporting Server configuration. While this value could be increased, that does not solve the problem as Internet Explorer does not support more than 2083 characters (KB 208427).

**Workaround:** Do not include the link when scheduling performance reports containing more than four performance graphs.

Service Level Dashboard

- Service Level Dashboard reports do not contain the Dundas gauge images.

**Solution:** You must install the Service Level Dashboard .msi on all reporting servers. The installation routine registers the Dundas gauge library with the SQL Reporting Service.

Additional Reading

- Configuring a Report Server Scale-Out Deployment (SQL Server 2005 Books Online)
- How to troubleshoot IIS configuration issues in SQL Server 2005 Reporting Services (KB 958998)
- Configuring Application Pools in IIS 6.0 (Technet Magazine)
- How to change the default Web Console start view (SystemCenterForum)

Feedback

I hope you find this article helpful. Your feedback is always welcome and appreciated at rburri[AT]bluewin.ch