



BlackBerry AtHoc



BlackBerry AtHoc Networked Crisis Communication
IIM Health Monitoring
Installation Guide

Version: 7.5

May 2018

Copyright © 2018 BlackBerry Limited. All Rights Reserved.

This document may not be copied, disclosed, transferred, or modified without the prior written consent of BlackBerry Limited. While all content is believed to be correct at the time of publication, it is provided as general purpose information. The content is subject to change without notice and is provided “as is” and with no expressed or implied warranties whatsoever, including, but not limited to, a warranty for accuracy made by BlackBerry Limited. The software described in this document is provided under written license only, contains valuable trade secrets and proprietary information, and is protected by the copyright laws of the United States and other countries. Unauthorized use of software or its documentation can result in civil damages and criminal prosecution.

Trademarks

Trademarks, including but not limited to ATHOC, EMBLEM Design, ATHOC & Design and the PURPLE GLOBE Design are the trademarks or registered trademarks of BlackBerry Limited, its subsidiaries and/or affiliates, used under license, and the exclusive rights to such trademarks are expressly reserved. All other trademarks are the property of their respective owners. Users are not permitted to use these marks without the prior written consent of AtHoc or such third party which may own the mark.

This product includes software developed by Microsoft (<http://www.microsoft.com>).

This product includes software developed by Intel (<http://www.intel.com>).

This product includes software developed by BroadCom (<http://www.broadcom.com>).

All other trademarks mentioned in this document are the property of their respective owners.

Patents

This product includes technology protected under [patents and pending patents](#).

BlackBerry Solution License Agreement

<https://us.blackberry.com/legal/blackberry-solution-license-agreement>

Contact Information

BlackBerry Limited

2988 Campus Drive, Suite 100

San Mateo, CA 94403

Tel: 1-650-685-3000

Email: athocsupport@blackberry.com

Web: <http://www.athoc.com>

Contents

| | |
|--|-----------|
| CHAPTER 1: OVERVIEW | 1 |
| CHAPTER 2: INSTALL AND SET UP WINDOWS PERFORMANCE COUNTERS | 2 |
| Install all Windows Performance Counters | 2 |
| Verify the installation | 2 |
| Windows counters from IIMAgent C# project | 3 |
| Install IIMAgent as a service | 4 |
| CHAPTER 3: CONFIGURE IIM HEALTH MONITOR IN THE BLACKBERRY ATHOC MANAGEMENT SYSTEM | 7 |
| CHAPTER 4: SOLARWINDS | 10 |
| Hardware requirements | 10 |
| Download SolarWinds Server and Application Monitor | 10 |
| Install SolarWinds | 10 |
| Activate licenses | 10 |
| Set up a node | 11 |
| Troubleshoot a failed connection test | 12 |
| CHAPTER 5: CONTACT BLACKBERRY ATHOC TECHNICAL SUPPORT | 15 |

Chapter 1: Overview

Windows Performance Counters can be used to monitor the health of IIMs. Windows Performance Counters can be updated with different performance parameters and can be integrated with SolarWinds for centralized health monitoring.

With the current design, some Windows Performance Counters are updated from IIM java code and other Windows Performance Counters are updated from IIMAgent C# project. This guide describes how to install all Windows Performance Counters and IIMAgent as a service.

Chapter 2: Install and set up Windows Performance Counters

This section describes how to install and verify Windows Performance Counters from IIM Java code and IIMAgent C# project.

Following is the list of Windows Performance Counters:

- RAW_NUM_CONT_POLL_FAIL
- IIM_JAVA_ERROR
- IIM_SERVICE_ERROR

Install all Windows Performance Counters

Only the RAW_NUM_CONT_POLL_FAIL counter is updated from the IIM Java code. This counter gives the count of consecutive BlackBerry AtHoc management system polling failures from the IIM. After polling is successful, this counter is reset to zero.




To create all Windows Performance Counters, complete the following steps:

1. Log in to IIM.
2. Stop the capnode services.
3. Download the capnode.ZIP file for Eaton Cooper build # 314 from the following link:
<https://repo.athoc.com/artifactory/webapp/#/builds/Build%20IIM/314/1515176625881/published/Build%20IIM:314> and extract it to C:/Program Files/capnode.
4. Open Windows Power Shell as an administrator and run the `createWinCounters_v1.ps1` power shell script. The necessary Windows Performance Counters are created in the IIM.
5. Add the `updateWindowsCounters = yes` parameter to
`C:/Program Files/capnode/system.config`.
Note: If this property is not defined, the system takes the default value as "no".
6. Start the capnode service.

Verify the installation

To verify if the Windows Performance Counters are installed correctly, complete the following steps:

1. Log in to IIM.
2. Click **Start** and search for the Performance Monitor program in Windows. Open the Windows performance monitor in IIM.
3. Navigate to **Performance > Monitoring Tools** and click **Performance Monitor**.

4. Click the  (Delete) icon, to remove the default services running in the Performance Monitor program.
5. Click the  (View Log Data) icon. The Performance Monitor Properties window opens.
6. Click the **Graph** tab.
7. In the Vertical scale section, set **Maximum** to **10**.
8. Click **OK**.
9. Click the  (Add) icon. The Add Counters window opens.
10. In the Add counters screen, double click **IIM.Monitoring**. All the monitors are selected.
11. Click **Add**. The added counters appear on the right side of the window.
12. Click **OK**. The counters are added to the Performance Monitor graph.
13. If the IIM is able to poll the configured BlackBerry AtHoc management system, then the `RAW_NUM_CONT_POLL_FAIL` counter shows zero.
14. To simulate a network failure, do one of the following:
 - If you have physical access to IIM, remove the IIM network cord. This results in a polling failure as IIM is unable to poll the BlackBerry AtHoc management system.
 - Map an incorrect IP for the BlackBerry AtHoc host name in the IIM `etc/hosts` file.
15. Check the performance monitor. The performance monitor should show a non zero count for the `RAW_NUM_CONT_POLL_FAIL` Windows Performance Counter. It can take 60 to 90 seconds for the counter to update. If the network failure persists, the counter value will keep incrementing.
16. Connect the network again and check the IIM logs to see if IIM is able to poll BlackBerry AtHoc successfully. If the connection is restored, the `RAW_NUM_CONT_POLL_FAIL` Windows counter is reset to zero.
17. Upon successful posting to the BlackBerry AtHoc management system, a relay gets closed and the led light glows indicating that the alert is sent successfully.
18. Repeat steps 9 to 12 for several times.

Windows counters from IIMAgent C# project

The following features are implemented in IIMAgent C# project to support Windows Performance Counters:

1. Disable the BlackBerry AtHoc management system polling from IIMAgent.
2. Update the Windows counters, if there is a java setup error in the IIM.
3. Update the Windows counters, if a required service is not running in the IIM.
4. Make external watchdog configurable from IIMAgent's config file.

Install IIMAgent as a service

You must create an IIM Agent V2 that writes health, polls information to Windows Performance Counters, and sends an SDK alert to the BlackBerry AtHoc management system where there is a service error or Java error.

To install the IIM Agent as a service, complete the following steps:

1. Log in to IIM.
2. Open a command prompt as an administrator and navigate to `C:\Program Files\capnode\IIMAgent_Build`.
3. Run the `install.bat` file and then close the command window.
4. Navigate to `C:\Program Files\capnode\iimm` and open the `IIMAgent.exe.config` file. The file has two tags related to configuring the service.


```
<add key="ServiceCount" value="2"/>
<add key="Service1" value="AudioSrv,start"/>
<add key="Service2" value="CapCon,start"/>
```
5. Enter the number of services you want to configure in the `<ServiceCount>` tag. The value of the `ServiceCount` key must be equal to the number of services you want to configure.
6. Create the keys from `<Service(n)>` where 'n' stands for the number of services in the service count.
7. Enter the service you want to monitor and the state of the service. For example, `AudioSrv,start` indicates that the `AudioSrv` must be running. The value of the parameter has the following two parts:
 - ServiceName
 - ServiceState

Note: For the services that are included in the `IIMAgent.exe.config` file, set **Start type** to Automatic by right-clicking the Components Services, and then select **Properties > Automatic**. When IIM restarts, if **Start Type** is not set to automatic, you must start IIM manually to enable BlackBerry AtHoc alerts.
8. Add the `EnableIWSPolling` parameter in the BlackBerry AtHoc Java polling threads configuration. Add the following line in the `IIMAgent.exe.config` file:


```
<add key="EnableIWSPolling" value="no"/>
```

If the value of the parameter is set to 'yes', IIMAgent polls the BlackBerry AtHoc management system. If the parameter is not added in the `IIMAgent.exe.config` file, IIMAgent does not poll the BlackBerry AtHoc management system.

Note: If watchdog service is installed in your system, then disable it, otherwise it can result in continuous restarting of the system.
9. In the BlackBerry AtHoc management system, do the following:
 - a. Create an IIM template for IIMAgent Errors.
 - b. In the Template Title add the following text:

[[IIM Agent Error Type]] at [[IIM ID]].

Note: [[IIM ID]] is replaced with the IIM ID provided in the IIMAgent.exe.config file.

- c. Add the following text in Alert Template Body:

[[IIM Agent Error Type]] occurred at IIM [[IIM ID]] [[Error Message Body]]

Note: [[IIM Agent ErrorType]] is replaced with the value of the Error Type (Service Error or Java Error) that is passed to the SDKAlert. [[Error Message Body]] is replaced with the error message that is passed in the SDKAlertTemplate.

10. Note down the Common Name of both alert templates.
11. Add the following parameters in the IIMAgent.exe.config file:

```
<add key="SDKURL" value="https://iwshostname/sdk/listener/listen.asp"/>
<add key="SDKUserName" value="username"/>
<add key="SDKPassword" value="password"/>
<add key="SDKVPSId" value="1234567"/>
<add key="SDKAlertTemplateCommonName" value="5415caa4-9211-4c6a-b0cc-796c5dfcb911"/>
<add key="IIMId" value="IIM-IP_OR_IIM_Name"/>
#
#SDKAlertTemplateCommonName-value for this parameter must be the alert
template Common Name for Error Template that we have created in IWS
steps.
#
#SDKURL-Add the URL of the BlackBerry AtHoc management server you are
using.
#
#SDKUserName and SDKPassword-Add these details according to your server
user details
#
#SDKVPSId-This is the BlackBerry AtHoc management system organization
ID.
#
#IIMId-IIM ID of the IIM on which you are installing the IIMAgent.
```

12. Open Component Services, search for IIMAgent Service in the service list. Right-click and select **Properties**. Change the **Startup Type** to Automatic (Delayed). Click **Apply >OK** and then run the service.

Note: Do not set the **Startup Type** to Automatic, it should be Automatic (Delayed).

13. Start and stop the service to check the installation. If the service is starting and stopping properly, then the installation is successful.

14. (Optional) If you already ran the `createWinCounters_v1.ps1` file for setting up Java counters, then do not run it again. For detailed information about how to create Windows Performance Counters from IIM Java code, see [Install all the Windows counters](#) section in this guide.
15. Start the IIMAgent Service from Component services.

Verify the installation

1. Open Windows Performance Monitor in the IIM.
2. Search for and start the Performance Monitor program in Windows. The Performance Monitor opens.
3. Navigate to **Performance > Monitoring Tools > Performance Monitor**.
4. Click **Add** and add all performance counters in the IIM Monitoring section.
5. To simulate a service error, do the following:
 - a. Navigate to the following path: `C:\Program Files\capnode\iimm`.
 - b. Open the IIMAgent XML document and see the services specified in the configuration file. The services are mentioned in the `<Service(n)>` tag, where 'n' stands for a numeric value. For example, `<Service1>`.
 - c. Navigate to the Performance Services and stop one of the services mentioned in the XML configuration file.
 - d. Check the performance monitor. It should increment the `IIM_SERVICE_ERROR` counter by one, as one service mentioned in the XML configuration file is not running. You can also stop other services mentioned in the configuration file. When you restart those services the counter decrements accordingly. It takes around 40 to 50 seconds to appear in the performance monitor.
 - e. Check if the value of the `IIM_SERVICE_ERROR` count is equal to the number of services which are present in the XML configuration file and if they are not running.
 - f. The `IIM_JAVA_ERROR` counter is updated if there is any problem with the Java setup on the IIM machine. The value of the counter is 0 if Java functions successfully on the machine. If there is a problem, the counter increments to 1.
6. In the BlackBerry AtHoc management system, check the alerts in Sent Alerts.
7. Check the email that is sent in service error and Java error templates. A BlackBerry AtHoc alert is sent only once per error. The alert is sent again, if the error is resolved or found.

Chapter 3: Configure IIM health monitor in the BlackBerry AtHoc management system

Prerequisite

Verify the following before you configure the IIM health monitor in the BlackBerry AtHoc management system:

1. In the Asset Tab, check the asset ID and execute the query highlighted in the following image:

```

/***** Script for SelectTopNRows command from SSMS *****/
SELECT * FROM [ngaddata].[dbo].[AST_ASSET_TAB]

```

| | ASSET_ID | PROVIDER_ID | ASSET_NAME | DESCRIPTION | GEO_LOCATION | EXPECTED_STATUS | REPORTED_ |
|---|----------|-------------|--------------|-------------|--------------|-----------------|-----------|
| 1 | 2 | 2050353 | Push | | NULL | OK | ok |
| 2 | 3 | 2050374 | Weather | NULL | NULL | OK | OK |
| 3 | 4 | 2051215 | Weather1 | NULL | NULL | OK | OK |
| 4 | 5 | 2050348 | 386077C65E28 | NULL | NULL | NULL | NULL |
| 5 | 6 | 2050376 | 00E06F29309B | NULL | NULL | NULL | NULL |
| 6 | 7 | 2086867 | 7071BCAD13BF | NULL | NULL | OK | OK |
| 7 | 8 | 2087023 | 4C72B97BF0D1 | NULL | NULL | NULL | NULL |

2. In the Activity tab, check for the asset ID and its activities by executing the highlighted query in the following image:

```

/***** Script for SelectTopNRows command from SSMS *****/
SELECT * FROM [ngaddata].[dbo].[AST_ACTIVITY_TAB]
order by ACTIVITY_TIME desc

```

| | ASSET_ID | ACTIVITY_NAME | ACTIVITY_TIME | ID |
|---|----------|---------------|-------------------------|---------|
| 1 | 7 | CAPNODEPOLL | 2018-04-19 16:44:24.973 | 3710548 |
| 2 | 5 | CAPNODEPOLL | 2018-04-19 16:44:23.447 | 3710547 |
| 3 | 8 | CAPNODEPOLL | 2018-04-19 16:44:21.767 | 3710546 |
| 4 | 5 | CAPNODEPOLL | 2018-04-19 16:44:19.893 | 3710545 |
| 5 | 7 | CAPNODEPOLL | 2018-04-19 16:44:17.410 | 3710544 |
| 6 | 5 | CAPNODEPOLL | 2018-04-19 16:44:16.360 | 3710543 |
| 7 | 5 | CAPNODEPOLL | 2018-04-19 16:44:12.823 | 3710542 |
| 8 | 7 | CAPNODEPOLL | 2018-04-19 16:44:09.820 | 3710541 |
| 9 | 5 | CAPNODEPOLL | 2018-04-19 16:44:09.253 | 3710540 |

3. In the SQL Server Management Studio, check if the stored procedure is available in **ngad-data > Programmability > Stored Procedure**.

```
Stored Procedure
USE [ngaddata]
GO

SET ANSI_NULLS ON
GO

SET QUOTED_IDENTIFIER ON
GO

IF EXISTS(SELECT 1 FROM sys.procedures where object_id = object_
id('dbo.mtr_iim_poll'))<A>column</A>
BEGIN
    DROP PROCEDURE dbo.mtr_iim_poll
END
GO


CREATE PROCEDURE [dbo].[MTR_IIM_POLL]
@assetId int,
@interval int = 5
as

select count (1)  pollcount from [ngaddata].[dbo].[AST_ACTIVITY_
TAB] where ASSET_ID = @assetId and
ACTIVITY_NAME = 'CAPNODEPOLL' and
ACTIVITY_TIME >= DateAdd(MINUTE, -@interval, GETDATE())
</DatabaseProcedureTestConfig>
```

4. Right-click the **dbo.mtr_iim_poll** stored procedure and click **Modify**.
5. Click **Execute** and verify the output.

Note: Health Monitor is organization specific. Ensure that the mass device is configured with the organization you are using.

To configure IIM health monitor in the BlackBerry AtHoc management system, complete the following steps:

1. Log in to the BlackBerry AtHoc management system as an administrator.
2. In the navigation bar, click the  (Settings) icon.
3. In the System Setup section, click **Global System Health**.
4. In the General section, click **IIM Poll**.
5. In the Testing history section, the polling interval is displayed by state. There are four states: Error, Warning, Good, and Inoperative.
6. (Optional) If the polling stops, click **Refresh** for manual polling.

IIM Poll
State reflects the most recent test result from 01/24/2018 03:18:04

Refresh | Disable | Delete

All monitored IIMs are reporting healthy conditions.

< Return to the Visibility Console

Testing history January 24, 2018 3:00 AM
Hourly | Daily | Weekly | Monthly

Good Warning Error Inoperative

| | |
|------|---------------------|
| Good | 01/24/2018 03:18:04 |
| Good | 01/24/2018 03:15:05 |
| Good | 01/24/2018 03:12:06 |
| Good | 01/24/2018 03:09:05 |
| Good | 01/24/2018 03:06:06 |
| Good | 01/24/2018 03:03:04 |
| Good | 01/24/2018 03:00:06 |

- In the Basic details section, in the **How often does it check the status of the system?** section, set a polling duration.
- In the Database Procedure section, in the **Test Configuration** text box, add an asset ID and interval in stored procedure. The following is an example of stored procedure:

```
<DatabaseProcedureTestConfig>
<Query> database.dbo.MTR_STORED_PROCEDURE_NAME @as-
setId=value,@interval=value</Query>
<WarningConditions />
<WarningCountThreshold>0</WarningCountThreshold>
<ErrorConditions>
<Condition>
<A>column</A>
<B>10</B>
<OffsetSeconds>0</OffsetSeconds>
<Comparison>LessThan</Comparison>
</Condition>
</ErrorConditions>
<ErrorCountThreshold>1</ErrorCountThreshold>
</DatabaseProcedureTestConfig>
```

- In the **How is the state of this Health Monitor determined?** section, from the **Match the state if:** list, select a value to determine the health from the last run result. For example, if $\text{PollCount} < 10$, the monitor will go into an error state.
- In the **What happens when this Health Monitor reaches a particular state?** section, in the **Configure Error State transition actions** section, click the **Show a list of possible actions** link. The Health Actions screen opens.
- Click the **<add this configuration** link for **Trigger a URL** or **Send an email**.
- Click **Save**.

Chapter 4: SolarWinds

The SolarWinds is Server and Application Monitor (SAM) used by system administrators to monitor windows counters on the client machine.

Hardware requirements

Decide the level of installation required (small, medium, or large). Click the following link to see the hardware requirements for the SolarWinds (SAM) installation:

<http://www.solarwinds.com/documentation/en/flarehelp/sam/content/sam-hardware-requirements.htm>

Download SolarWinds Server and Application Monitor

To download the SolarWinds server and application monitor, complete the following steps:

1. Click the following link: <http://www.solarwinds.com/downloads>.
2. Under **Server and Application Monitor** click **DOWNLOAD FREE TRIAL**. The free trial is active for 30 days.
Note: Contact the SolarWinds sales team for licensing.
3. Enter your information on the registration form, and click **PROCEED TO FREE DOWNLOAD**.
4. On the Thank you screen, click **DOWNLOAD NOW**.
5. Run the downloaded .exe file. The SQL server is also downloaded if not installed.

Install SolarWinds

Note: SolarWinds cannot be installed on a Domain Controller.

To install SolarWinds, complete the following steps:

1. To install SolarWinds, click the following link and complete all the steps: <http://www.solarwinds.com/documentation/en/flarehelp/sam/content/sam-install-sam-stand-alone.htm>.
2. After installing Solar Winds, click **Start > All Programs > SolarWinds Orion > Orion Web Console**.
3. To verify if the installation is successful, on the Login screen, enter the user name as **admin** and leave the password field blank and then click **Login**.

Activate licenses

To activate a purchased license, complete the following steps:

1. Access the Orion Web Console on the main polling engine or Orion server.
Note: Do not activate the license directly on the additional polling engine.

2. Click **Settings > All Settings**.
3. In the Details section, click **License Manager**.
Note: If you click **Add/Upgrade License**, enter the details, and complete the activation to see the license in the License Manager.
4. Select **Server and Application Monitor** and then click **Activate**.

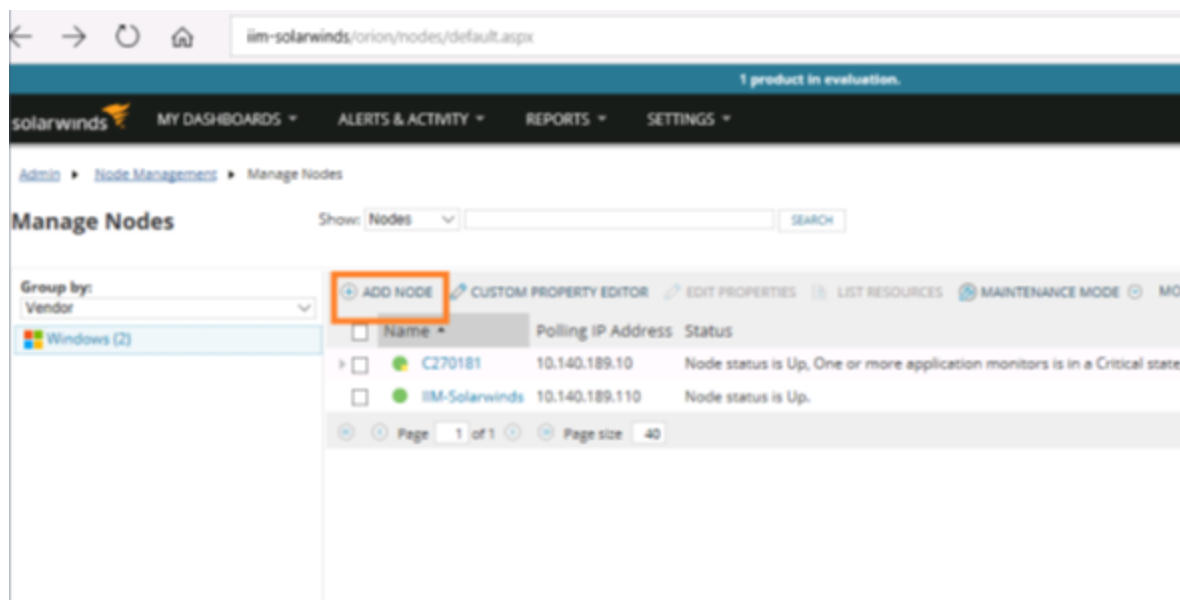
The screenshot shows the 'License Manager' interface. At the top, there are links for 'LICENSE DETAILS' and 'CUSTOMER PORTAL'. Below these are two buttons: 'ADD/UPGRADE LICENSE' and 'SYNCHRONIZE'. A search bar with a dropdown arrow and the text 'Product Name' is visible. The main area displays three license entries, each with a checkbox, a title, installed version, type, expiration date, and an 'ACTIVATE' button. The first entry is 'Network Performance Monitor - Evaluation NPM' with installed version 12.0.15100.38, type Evaluation, expiration Aug 28, 2016 - 21 days left, and is assigned to a server. The second entry is 'Orion High Availability HA' with installed version 2016.2.100.742, type Temporary, expiration Sep 3, 2016 - 26 days left, and is currently not assigned. The third entry is 'Server & Application Monitor - Evaluation SAM' with installed version 6.3.0.1267, type Evaluation, expiration Aug 28, 2016 - 21 days left, and is assigned to a server.

5. Enter the activation key.
Note: Log in to the Customer portal with your customer ID and password or your individual user account information to get the activation key.
6. Enter the registration details, and click **Activate**.
The license type, expiration date, assigned server, and the license key is displayed in the License Manager.

Set up a node

To set up a node, complete the following steps:

1. Open a command prompt and ping the IP Address of machine you want to add as a node. If the ping is unsuccessful, contact your IT administrator as the node is not reachable from the machine where you have installed the SolarWinds.
2. Log in to the Orion Web Console as an administrator.
3. Click on **Settings > Manage Nodes > Add a Node**. The Define Node screen opens.



4. In the **Polling Hostname or IP Address** field, enter the IP address of the node you want to add.
5. Select the **Windows Servers: WMI and ICMP** option and provide the following information:
 - a. **Choose Credentials:** From the list, choose the credentials you already have saved in your database. If you do not have credentials saved in your database, select **<New Credential>**.
 - b. **Credential Name:** Add any string that can identify the node for your reference.
 - c. **User Name:** Enter a user to log in to the remote computer. The user must have administrative permissions on that node.
 - d. **Password/Confirm Password:** Enter a password and re-enter the same password.
 - e. Click **Test**. If the connection test is successful, then you can connect to the node.
 - f. Click **Next**.

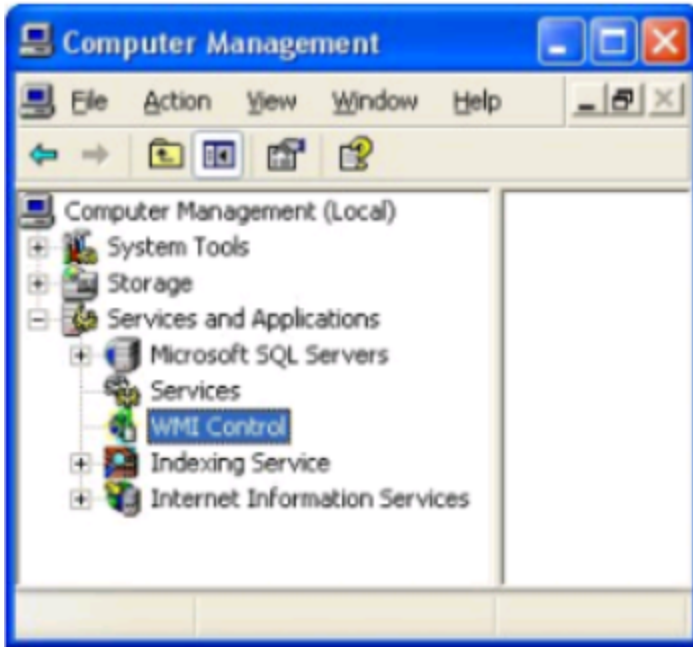
Troubleshoot a failed connection test

If the connection test fails, complete the following steps on the node computer and not on the SolarWinds server:

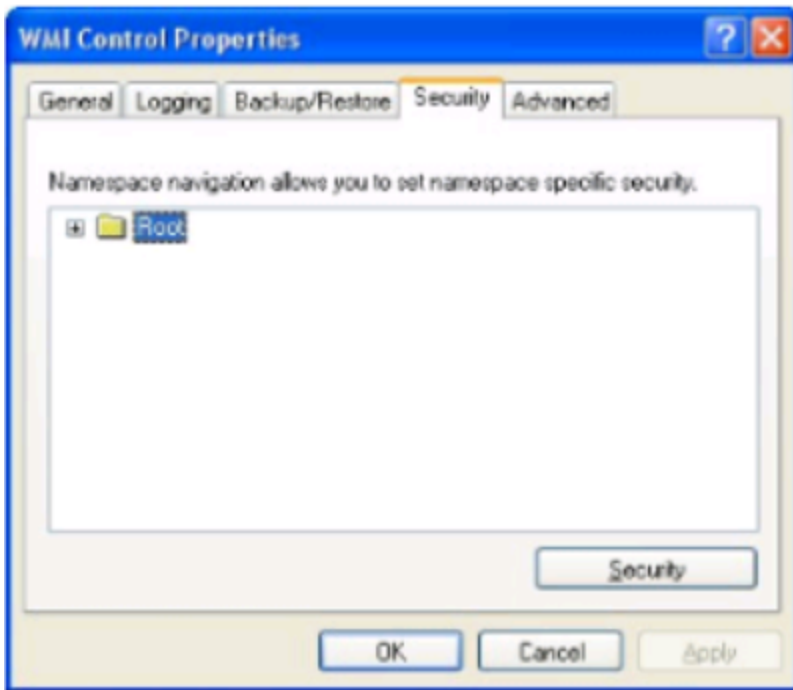
Enable remote Windows Management Instrumentation (WMI) requests

Change the following settings to get WMI working:

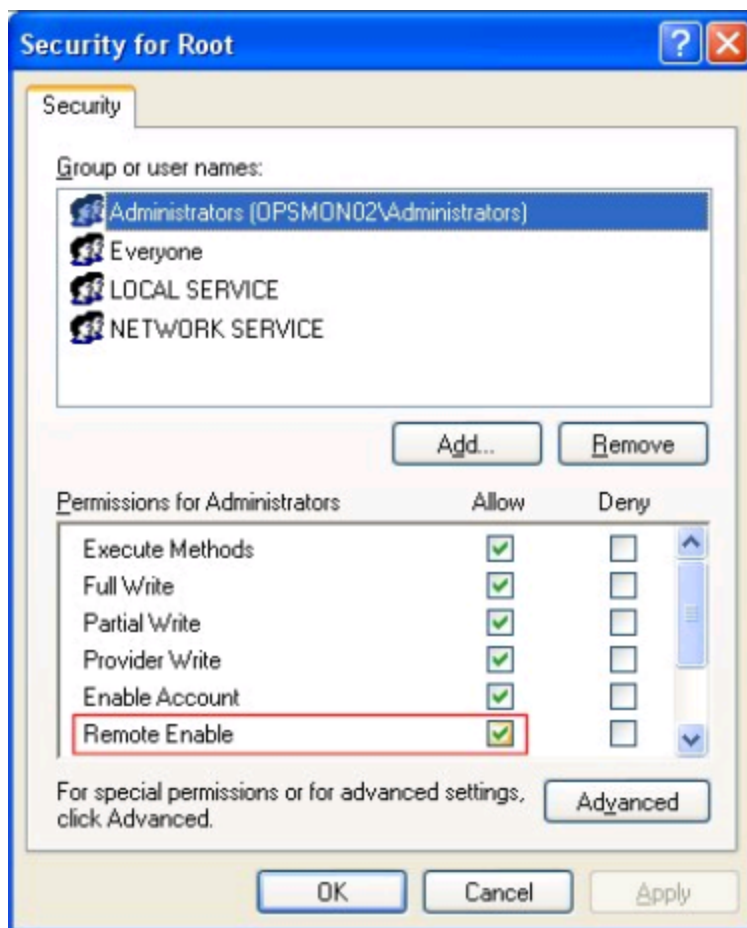
1. On the target server, go to **Administrative Tools > Computer Management**. Expand **Services and Applications**.
2. Right-click **WMI Control** and select Properties. The WMI Control Properties window opens.



3. Select on the **Security** tab and then click **Security**.



4. Click **Add** if you want to add a monitoring user.
5. Check **Remote Enable** for the user or group that is requesting WMI data.



6. Check if the connection is successful. Go to SolarWinds and try to add a node again using WMI in the SolarWinds server. If you are unable to add a node, complete the steps in the **Allow WMI through Windows firewall** section.

Allow WMI through Windows firewall

1. All users can read WMI data on their local computer. For reading WMI data on a remote server, a connection needs to be made from the computer you have installed the software to the server that you are monitoring (target). If the target server is running Windows Firewall, then open a command prompt and run the following command on the target computer:


```
netsh firewall set service RemoteAdmin enable
```
2. Check if you can add a node. If you are still unable to add, complete the steps in the **Enable DCOM calls on the remote machine** section.

Enable DCOM calls on the remote machine

If the account you are using to monitor the target server is an administrator but DCOM is not enabled for that user on the target server, you must enable the non-administrator to interact with DCOM on the node machine.

For detailed information on how to grant DCOM remote access permissions, see <https://msdn.-microsoft.com/en-us/library/Aa393266.aspx>.

Chapter 5: Contact BlackBerry AtHoc technical support

If you encounter any problems or have questions regarding the BlackBerry AtHoc software, contact BlackBerry AtHoc technical support using any of the following methods:

- **Web Site Form:** <https://support.athoc.com/customer-support-portal/-login.html>
- **Telephone:** (650) 685-3000 or (888) GO-ATHOC (462-8462)
- **Email:** athocsupport@blackberry.com

Note: The Web-based support form is the primary method for contacting BlackBerry AtHoc technical support.