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CHAPTER 1

Introduction

Objective
This document describes the installation process for the Accops HyWorks Controller 3.2 Software. This document covers all aspect of installation including required software, detailed installation steps and troubleshooting section.

Overview
Using new HyWorks Controller v3.2 setup, following roles can be installed independently or together on a Windows Server:

1. HyWorks Controller Service
   a. HyWorks Licensing Service
   b. HyWorks Upgrade Service
   c. HyWorks Monitoring Services
2. HyWorks Controller Management Console
   a. Management Console for Administrator
   b. User Portal for desktops and applications access
   c. RMS Portal for reservation management
3. HyWorks Session Host Server
   a. HyWorks Session Host Service
   b. HyWorks Monitoring Service

Important for Upgrade

Note:
➢ Accops HyWorks Controller v3.2 cannot be upgraded with any previous skyControl versions or HyWorks v2.5 with embedded database
➢ Accops HyWorks Controller can work in parallel with Propalms skyControl on the same server for ease of migration from skySpace to HyWorks

How to Use This Document?
When installing the Accops HyWorks Controller 3.2 Software, administrators are encouraged to follow the order specified below:

1. Section 2 (Understand the system requirements for installing Accops HyWorks v3.2)
2. Section 3 (Detailed installation steps)
3. Section 5 (Troubleshooting if any)
CHAPTER 2

System Requirements

Platform Support

Supported Operating Systems

HyWorks Controller can be installed on the following Windows Server Operating systems:

- Windows 2012 R2 x64
- Windows 2008 R2-SP1-x64
- Windows 2016 x64

**Note:**
- The installer can be run on other Windows platforms also which fulfills the system configuration and software requirements. However, it is recommended to install the software only on the mentioned server class machines for better and trouble-free performance.

Supported Databases

HyWorks Controller supports following flavors of Microsoft SQL Server:

1. Microsoft SQL Server 2008
2. Microsoft SQL Server 2012
3. Microsoft SQL Server 2014
4. Microsoft SQL Server 2016
5. Microsoft SQL Server 2017

Please refer section [Preparing Microsoft SQL Server for HyWorks Deployment](#) for detailed instructions on SQL Server configurations for HyWorks installation.

System Configuration

Windows server should be running with following minimum resources to be configured as Accops HyWorks Controller:

- Minimum 4GB RAM
- 4 vCPUs
- 10 GB HDD for installation, dependencies and post installation management files

**Please note** this is minimum requirement for configuring HyWorks Controller on Windows server but appropriate server sizing should be done as per expected load and roles configurations.
Software Requirements
To configure Windows Server with HyWorks Controller following software must be installed and configured on the system:

1. **.Net 4.7.2** (Please refer section Installing .Net 4.7.2 for detailed instructions)
2. **Microsoft SQL Server** (Standard or Express Edition) (Please refer section Preparing Microsoft SQL Server for HyWorks Deployment)
3. **Microsoft Sync Framework v2.1** (*Required for HyWorks Controller Clustering*)
CHAPTER 3

Installation

The installer can be run in the following operational modes:

1. Fresh Installation Mode
2. Maintenance Mode
   a. Add New Components
   b. Repair
   c. Upgrade
   d. Un-installation

The document will provide details of each of the operations in below sections:

Fresh Installation Mode

HyWorks Controller Installation

Any time the installer is invoked in a system where no previous installation of Accops HyWorks Controller exists, the installer will run in fresh installation mode and administrator will be able to only install the Accops HyWorks Controller or Session Host Server. The following steps can be executed for installation of Accops HyWorks Controller on the system in fresh installation mode:

1. Log-in to Windows Server as a user with administrative rights.
2. Copy the Accops HyWorks Controller installer to Windows Server having following prerequisites configured
   a. Appropriate .Net version 4.7.2 is already installed on the system
   b. SQL Server is installed and configured with static TCP port for HyWorks Deployment
   Please refer section System Requirements for understanding the System Requirements for Accops HyWorks Controller
3. Launch the Installation wizard by right click on the installer and select option Run as Administrator, wait for Setup Wizard to initiate
4. Click on **Next** button on the welcome Screen to proceed with installation.

5. On ‘License Agreement’ screen, select if you accept the terms and click on **Next** button to proceed.
6. The next screen allows configuration of the installation directory

a. Installation on default installation folder:
   i. The default installation folder is: “C:\Program Files (x86)\Accops”

b. Changing installation folder:
   i. Click on **Browse** button
   ii. Select any appropriate folder and click on **OK** button
   iii. Click on **Next** button to proceed with installation

c. Click on **Next** button to proceed to ‘**Component Selection**’ screen

7. **Component Selection** screen provides the option to select HyWorks Components to be installed
   a. For HyWorks Controller configuration, only following two roles should be selected
i. Accops HyWorks Controller Service

ii. Accops HyWorks Management Console

b. 3rd Option to install HyWorks Session Hosts server should only be selected, if the same server will be used to serve the shared hosted desktops or applications to the end users.

Note:
➢ If it is not required to have Shared VDI or application delivery from same server, keep the Accops HyWorks Session Host option as unchecked

8. Clicking on Next button will navigate to Database Selection screen; on Database Selection screen
   a. Provide the Database Address in the format of \<Server IP or FQDN>\<SQL Instance Name> e.g. if SQL Express is installed on the same instance then Database address could be localhost\SQLExpress
   b. Provide the static port of Microsoft SQL Server e.g. 1433 (Default TCP Port for SQL Server)
   c. Database name: Provide the name of the database to be created, default name is EDCDB
   d. Select appropriate authentication mechanism, possible methods are
      i. SQL Server Authentication, which will require SQL Server User and Password
      ii. Windows Authentication, to use windows user credentials to connect to SQL Server
Note:

➢ In HyWorks v3.2, support for embedded database for service has been deprecated and thus installation is supported with SQL Servers only.
➢ Upgrade of existing HyWorks deployments using embedded database should not be attempted to avoid data loss and setup corruption. Please contact Accops support for guidance on existing setup upgrade.

9. Provide appropriate details and then click on Next button to proceed
10. Next screen Log Database Selection provides option to configure log server with following options:
    a. Use Embedded Database (Uses SQL CE 4.5 for Logs)
    b. Microsoft SQL Server (Uses SQL Server for logging) – Recommended
SQL Server Logging is having following advantages over Embedded Log Server:

- Faster Log viewing in HyWorks Management Console
- Ability to keep more logs than embedded log server
- Using SQL Management Studio for viewing logs
  - Explicit queries can be used to filter logs in SQL Management Studio

Select appropriate log server as per requirement, configuring Embedded Log server will not require any additional configuration, whereas configuring SQL Server for logging will require providing following information:

a. Provide the Database Address in the format of `<Server IP or FQDN>\<SQL Instance Name>`, e.g. if SQL Express is installed on the same instance then Database address could be localhost\SQLExpress

b. Provide the static port of Microsoft SQL Server e.g. 1433 (Default TCP Port for SQL Server)

c. Database name: Provide the name of the database to be created, default name is HyLog

d. Select appropriate authentication mechanism, possible methods are
  i. SQL Server Authentication, which will require SQL Server User and Password
  ii. Windows Authentication, to use windows user credentials to connect to SQL Server
Important Notes for configuring SQL Logging Server:

➢ It is recommended to use separate instance than the one used as HyWorks database server
➢ “sa” authentication should be used for logging to avoid any misconfigurations.
   ❖ Windows authentication for log server should only be used, when HyWorks database configuration is also using Windows authentication and both SQL instances are configured to accept the credentials used to run HyWorks service.

11. Next screen configures the Service Log-on Credentials for HyWorks Controller Service, following two options are presented based on SQL Server configurations done:
   a. **Local System Account: (Recommended)** Using Embedded or SQL Server with ‘sa’ user credentials will run the service with Local System Account

   ![Config service logon credentials](image)

   - **Login as:**
     - Local System Account
     - This Account
   - **Password:**
   - **Confirm Password:**

   Specify login information. Account name for Windows service and its credentials. HyWorks Controller service will run under the given account.

   Note: Please make sure configured user is having appropriate i.e. “Log on as a service” privileges on the system. Insufficient privileges may cause failures in starting HyWorks Controller Service.

   b. Configuring SQL Server with **Windows Credentials** will require Logon Credentials to be used to run the HyWorks Controller service
i. After providing appropriate Service Log-on credentials, click on **Next** button to proceed.

### Important Note:

➢ Configured account must have **logon as a service** privileges on the system. Otherwise HyWorks Controller service will fail to start after the installation.

Below steps can be used to configure users accounts with **logon as a service** privilege:

1. Click **Start**, point to **Run**, type mmc, and then click **OK**.
2. On the **File** menu, click **Add/Remove Snap-in**.
3. In **Add/Remove Snap-in**, click **Add**, and then, in **Add Standalone Snap-in**, double-click **Group Policy Object Editor**.
4. In **Group Policy Object**, click **Browse**, browse to the Group Policy object (GPO) that you want to modify, click **OK**, and then click **Finish**.
5. Click **Close**, and then click **OK**.
6. In the console tree, click **User Rights Assignment**, the option is available at following location:


7. In the details pane, double-click **Log on as a service**.
8. If the security setting has not yet been defined, select the **Define these policy settings** check box.
9. Click **Add User or Group**.
10. Add the appropriate account to the list of accounts that possess the **Log on as a service** right.

12. Next screen **Restore Database** provides option to restore an existing database during installation which enables administrator to quickly set new server with existing configurations.
13. Ignore this screen for fresh installation and click on **Next** button to proceed

![Setup Wizard]

Refer document **HyWorks Backup and Restore** for detailed instructions on restoration.

14. Clicking on **Next** button will navigate the user to ‘Port Setting’ screen
   a. Default port for Accops HyWorks Controller Service is 38866, to change it enter any appropriate port number or leave it intact to continue with default port
   b. Default port for Accops HyWorks Management Console is 443, to change it enter any appropriate port number or leave it intact to continue with default port
   c. Click on **Next** button to proceed with installation

![Port Setting]

15. Next installation screen is for **configuring HyWorks Controller administrators**. The following types of Administrator configurations can be done:
a. Domain User Group configured as super-administrator
b. Local HyWorks user created and designated as Super-administrator

1. Domain Group Configuration:
For configuring Domain User group, the following conditions must be met:
   a. System is in domain
   b. User is logged in with domain credentials
   c. Following inputs are provided correctly
      i. User will be needed to provide Domain User Group name
      ii. Credentials of the one of the user accounts which belongs to the Domain
         user group specified

2. Local User Configuration:
For creating a local user administrator, user will be needed to provide the username (default
is HyWorksAdmin), appropriate password and confirm password.
16. On **Confirmation’ screen**, click on **Install** button to confirm the installation.
   a. The screen displays the information of the selected components.

17. Installation will be started, and appropriate roles and feature will be installed. Next screen will display status and updates of installation progress. The screen displays the following information:
   a. Component being installed
   b. Installation status of the component
   c. Progress bar and related information of the changes being made to the system
HyWorks Controller Service and Management Console installation, installs and configures following roles and features on Windows Servers

- Web Server (IIS) role with appropriate features will get automatically installed with Accops HyWorks Controller Management Console.

18. Once the installation is completed, admin will be shown a screen displaying the following:
   a. Installation status of individual components
   b. URL of Accops HyWorks Management Console (if Installed)

**Installation Verification**

Administrator can verify the successful installation by verifying the installation logs and running services as mentioned below:

1. Setup Status Prompt
Setup Status is displayed on the last screen of installation. It displays details about all the installed components and their respective status

2. Access and log-in to Accops HyWorks Management Console
   a. After the successful installation, open Supported browser (IE11, Firefox or Google Chrome) and type the URL: https://<IP of HyWorks Controller>:<port number> e.g.,
   b. Provide appropriate credentials and Log-in

**HyWorks Session Host Server Installation**

HyWorks Session Host Server components are required on Windows RDS Servers to enable it for delivering Applications and Shared desktop to end users using HyWorks. HyWorks Session Host server can be installed either using same setup of HyWorks controller or using a separate installer setup.

This section will have the detailed steps required to install HyWorks Session Host Server on Windows servers.

**Pre-requisites for HyWorks Session Host Server Installation:**

1. **.Net 4.7.2(or later)**
   a. Please see details in section [Software Requirements](#)

**Installation Process:**

Follow the below steps to install HyWorks Session Host server on Windows servers:

1. Log-in to Windows Server as a user with administrative rights.
2. Copy the Accops HyWorks Controller installation setup or independent HyWorks Session Host Server setup on Windows server to be configured with HyWorks Session Host server role
3. Launch the Installation wizard by right click on the installer and select option Run as Administrator, wait for Setup Wizard to initiate.
4. Click on **Next** button on the welcome Screen to proceed with installation.
5. On ‘License Agreement’ screen, select if you accept the terms and click on **Next button** to proceed.

6. The next screen allows configuration of the installation directory.
a. Installation on default installation folder:
   i. The default installation folder is:
      “C:\Program Files (x86)\Accops”

b. Changing installation folder:
   i. Click on Browse
   ii. Select any appropriate folder and click on OK button
   iii. Click on Next button to proceed with installation

7. Click on Next button to proceed to ‘Component Selection’ screen
   a. If HyWorks Controller setup is being used, then Component selection screen
      will appear, and admin must select only option of Accops HyWorks Session
      Host Server

      This screen does not apply to Standalone Session Host installer and user will be navigated to
      Confirmation screen directly.
8. Click on **Install** button to start installation of HyWorks Session Host.

a. Installation will automatically enable all the required roles, features and HyWorks components required for working of Accops HyWorks Session Host. The following components are installed:

   i. **Microsoft Remote Desktop Services**: Once HyWorks Session Host Server role is selected during installation; remote desktop server role will get installed automatically.

   ii. **Accops HyWorks Session Host service**: Required for delivering application, shared hosted desktops from session host server and management

   iii. **Accops HyWorks Monitoring Service**: Required for system performance monitoring
iv. **Accops RDP Extensions**: Required for HyPrint and sending messages to logged-in users

Current state of installation is displayed on screen.

9. Once the installation is complete System reboot might be required so that windows can make necessary changes to system to facilitate session host functioning. -> Click on Yes button to restart the computer.

10. Windows server is ready with Accops HyWorks Session Host server role configured.
Maintenance Mode

Re-running the same HyWorks Controller setup (The one which was used to install HyWorks Controller) or later HyWorks Controller setup opens the installer in Maintenance mode and provides the following options based on the existing installation and the setup you are using:

1. Add New Components
2. Repair
3. Upgrade
4. Uninstall

Add New Components

If an administrator has installed only one of the Accops HyWorks Controller components (i.e. Accops HyWorks Controller Service or Accops HyWorks Management console) in fresh install, then re-running the installer will provide the option to add new components. Proceeding with this option will enable the user to install the remaining component of the Accops HyWorks Controller. Use the below mentioned steps to add new component to Accops HyWorks Controller:

1. Login to Windows Server as a user with administrative rights.
2. Copy the Accops HyWorks Controller installer to your machine
3. Launch the Installation wizard by right click on the installer and select option Run as Administrator.
4. Accops HyWorks Controller installer will open in Maintenance mode if it detects any existing installation is present and provides the following possible operations to user:
   a. Add New Components
   b. Upgrade (Disabled if running same installer setup, enabled if running newer installer)
   c. Repair (Enabled if running same installer setup, disabled if running newer installer)
   d. Uninstall

5. Select option Add New Components and click on Next button
6. The next screen will provide the list of installed and available components. Admin will be able to select only those components which were not installed previously e.g.
   a. If Controller Service and Management Console are installed, then option to install Session Host Server will be displayed
   b. If Accops HyWorks Controller Service was installed previously, Add New Components will enable the Accops HyWorks Management Console and Session Host Server
   c. If Accops HyWorks Management Console was installed previously Accops HyWorks Controller and Session Host Server will be enabled in Add New Components wizard.

7. Rest of the installation steps are same as fresh installation. Please refer to steps provided in section

Repair

The repair installation flow will only be enabled when the system already has at least one of the Accops HyWorks Controller components installed and admin runs the same installer setup which was used to install the existing component. Admin can repair the existing setup using the following steps:

1. Log-in to Windows Server as a user with administrative rights.
2. Copy the Accops HyWorks Controller installer to your machine
3. Launch the Installation wizard by right click on the installer and select option Run as Administrator.
4. Accops HyWorks Controller installer will open in Maintenance mode if it detects any existing installation is present and provides the following possible operations to user:
   a. Add New Components
   b. Upgrade (Disabled if running same installer setup, enabled if running newer installer)
   c. Repair (Enabled if running same installer setup, disabled if running newer installer)
g. Uninstall
5. Select option **Repair** and click on **Next** button

6. Same as fresh install, the next screen provides the option to choose the component to be repaired. Select one or more component and click on **Next button**.

7. Service Logon Credentials screen will require providing the account information with which Accops HyWorks Controller service will run. (Please refer Fresh Install steps for details)
8. Existing database can be restored. Click on Do you want to restore database. Browse database using browse button.
   a. For HyWorks Controller with SQL Server database, file format should be *.bak

Note:
➢ If selected backup file is of SQL Server type, then administrator should first move the backup file to SQL Server – Backup folder. The default location of SQL Server (x64) backup folder is as follows:
   C:\Program Files (x86)\Microsoft SQL Server\MSSQL11.SQLEXPRESS\MSSQL\Backup

Refer document *HyWorks Backup and Restore* for detailed instructions on restoring HyWorks Controller using backed up database.
9. On ‘Port Settings’ screen, admin will be able to re-configure the ports for the selected components, insert new ports details and click on **Next button** or leave settings as they are to keep the same ports.

**Note:** Changing the port information will impact existing devices.
- The existing session will be disconnected
- All registered devices (Configured to connect Controller using manually provided IP) will be required to be reconfigured for using new port.

10. Next installation screen is for configuring HyWorks Controller administrators. The following types of Administrator configurations can be configured:
   a. **Domain Group Configuration:** For configuring Domain User group, the following conditions must be met:
      i. System is in domain
      ii. User is logged in with domain credentials
      iii. Following inputs are provided correctly
         - User will be needed to provide Domain User Group name
         - Credentials of the one of the user accounts which belongs to the Domain user group specified
   Click on **Next** button to proceed with configured user group
a. **Local User Configuration**: For creating a local user administrator, user will be needed to provide the username (default is HyWorksAdmin), appropriate password and confirm password.

**Note:**

- As described in above step # 7, Repair mode requires the reconfiguration of HyWorks Administrators; this mode can be used to update the HyWorks Administrator password as well (If lost)
- Repair operation resets the existing configuration files also. If any configuration changes have been done in HyWorks Controller using the configuration files, then all the modifications will be lost after the repair/ upgrade operation and must be re-configured. (Service restart will be required to bring the changes into effect)

11. On the next screen, information is provided for the selected components, click on Repair button to confirm the operation
12. Wait for the repair operation to completed, the screen will display the operation progress and associated messages

13. Once repair operation is completed, admin will be navigated to the last screen. The last screen will display information of the repaired components, status of the repair operation and link to access the Accops HyWorks Management Console. Click on Close button to exit from installation wizard.
Uninstall
The Uninstall flow will be enabled when system already has an existing installation of Accops HyWorks Controller and admin re-runs the same or newer installation. To uninstall one or more component admin can follow the below steps:

1. Login to Windows Server as a user with administrative rights.
2. Copy the Accops HyWorks Controller installer to your machine
3. Launch the Installation wizard by right click on the installer and select option Run as Administrator.
4. Accops HyWorks Controller installer will open in Maintenance mode if it detects any existing installation is present and provides the following possible operations to user:
   a. Add New Components
   b. Upgrade (Disabled if running same installer setup, enabled if running newer installer)
   c. Repair (Enabled if running same installer setup, disabled if running newer installer)
   d. Uninstall

1. Select option **Uninstall** and click on **Next** button
2. On component selection screen, user can choose from the installed components. Select one or more components to be uninstalled and click on Next button.
   a. **Remove Service Database** option enables administrator to remove database which was created during installation of HyWorks Controller.
   b. Selection of option **Remove Log Database** will remove the logs database from the specific instance of SQL Server. To keep the logs, this option can be unchecked.

**Note:**
➢ If the option ‘Remove Database’ is not checked, then re-installation of HyWorks Controller with same database server will use existing database file.

3. On next screen, information will be provided for the selected components, click on Uninstall button to confirm the operation.
4. The admin will be displayed with un-installation progress and relevant messages during un-installation. Wait for Uninstall operation to be completed.

5. After the un-installation completion, admin will be navigated to the last screen. This consists of the information of the uninstalled component and respective status of the same. Click on Close button to exit the installation wizard.
Limitations:
- HyWorks Controller on uninstallation does not remove the following Windows roles and features installed to avoid affecting currently logged on users:
  - Web Server (IIS): In case of HyWorks Controller Management Console uninstallation
  - Remote Desktop Session Host: In case of uninstallation of HyWorks Session Host Server

Upgrade
Upgrade Process – HyWorks Controller

Note:
- Please note the upgrade over HyWorks v2.5 with Embedded DB is not supported with HyWorks v3.2 version.
- For upgrading any production or evaluation deployment, contact Accops Team for assistance and feasibility to upgrade.

The Upgrade installation flow will only be enabled when admin has installed an older version of Accops HyWorks Controller and then runs a newer installer (v3.2 or later) on the same system. The installer will detect the existing installation and will run in maintenance mode with the ‘Upgrade’, “Add New Components” and ‘Uninstall’ operations enabled and ‘Repair’ operation disabled.

"Add New Components" option can be used to install HyWorks Session Host Server role on the existing installation of HyWorks. Please refer section Add New Components for detailed steps.

Admin can follow the below steps to upgrade the existing Accops HyWorks Controller setup:
1. Login to Windows Server as a user with administrative rights.
2. Copy the Accops HyWorks Controller installer to your machine
3. Launch the Installation wizard by right click on the installer and select option **Run as Administrator**.

4. Accops HyWorks installer will open in Maintenance mode if it detects any existing installation is present and provides the following possible operations to user:
   a. Add New Components
   b. Upgrade (Disabled if running same installer setup, enabled if running newer installer)
   c. Repair (Enabled if running same installer setup, disabled if running newer installer)
   d. Uninstall

2. Select option **Upgrade** and click on **Next** button.

3. Same as fresh install, the next screen provides the option to choose the component to be upgraded. Select one or more component and click on **Next button**.

4. Same as Fresh Installation next screen is for configuring the Service Logon Credentials (Account
information with which Accops HyWorks Controller service will run). Provide appropriate details and click on **Next button** to proceed.

5. Please skip the Restore Database screen by clicking on **Next button** as upgrade with database restore is not yet supported.

6. On next screen, admin will be able to re-configure the port for the existing installation during upgrade. To change the ports, insert new port values and click on **Next button** or leave settings as they are to keep the same ports.
Note:
➢ If selected backup file is of SQL Server type, then administrator should first move the backup file to SQL Server – Backup folder. The default location of SQL Server (x64) backup folder is as follows:

C:\Program Files (x86)\Microsoft SQL Server\MSSQL11.SQLEXPRESS\MSSQL\Backup

7. Confirm the operation by clicking on Upgrade button. The action will start the upgrade operation.

8. Admin will be navigated to the screen with information of upgrade operation progress along with relevant messages. Wait for upgrade operation to be completed.
9. Once upgrade is completed, admin will be navigated to the last page, which will consist of the status of the individual components and the link to navigate to the ‘Management Console’.

Upgrade Process - HyWorks Session Host Server

HyWorks Session Host Server upgrade uses same approach as Controller upgrade and is very easy to perform.

**Note:**
- Session Host Server setup installs RDP extensions, upgrade might fail if active remote desktop sessions are running.

1. Log-in to Windows Server as a user with administrative rights.
2. Copy the Accops HyWorks Controller installation setup or independent HyWorks Session Host Server setup on Windows server to be configured with HyWorks Session Host server role.

3. Launch the Installation wizard by right click on the installer and select option Run as Administrator, wait for Setup Wizard to initiate.

4. Select option **Upgrade** and click on **Next** button.

5. Administrator will be navigated to confirmation screen displaying the components being upgraded.
6. Click **Upgrade** button to proceed

7. All HyWorks Session Host Server components will be upgraded, and user will be displayed with Success screen, click on **Close** button to dismiss the setup
Setup has successfully upgraded the following component(s):

- Accops HyWorks Session Host
HyWorks Controller Installation for Cluster

HyWorks Controller installation for cluster configuration follows the exact same steps as installation of standalone server. Few high-level steps are specified below:

- **Installing Primary HyWorks Controller**
  1. Make sure all system requirements are met and server is ready as specified in section System Requirements
     - .Net 4.7.2 is installed
     - SQL Server is installed and configured
  2. Install HyWorks Controller as specified in section HyWorks Controller Installation
  3. Install Microsoft Sync Framework v2.1 (Refer section Install Microsoft Sync Framework 2.1 for detailed instructions and download location)

- **Installing Secondary HyWorks Controller:**
  1. There are no special steps to install secondary HyWorks Controller, follow all the steps# 1-3 used to install primary HyWorks Controller server

- **Configuring HyWorks Controller Cluster**
  1. Please refer HyWorks Controller Admin guide and HyWorks Controller Clustering and High Availability guide
Post Installation Configurations

In different HyWorks deployments, it might be required to use RMS portal or User Portal. In this section of the document, such configurations are specified:

How to Enable RMS Portal Link on HyWorks Management Console

Following process should be enable RMS in HyWorks v3.2-GA:

1. Access HyWorks Controller Management Console server
2. Navigate to following folder:
   
   C:\Program Files (x86)\Accops\HyWorks\Mmc (Default installation directory of HyWorks Management Console)
3. Take backup of existing Web.config file
4. Open Web.config file and locate the Endpoint address for binding to controller services as shown in image below:

   ```
   <endpoint address="https://localhost:38866/PulseController.svc" binding="basicHttpBinding" bindingConfiguration="BasicHttpBinding_PulseController"_contract="IPulseService, IPulseController" name="BasicHttpBinding_PulseController" />
   <endpoint address="https://localhost:38866/ClientController.svc" binding="basicHttpBinding" bindingConfiguration="BasicHttpBinding_ClientController"_contract="IClientController, IClientController" name="BasicHttpBindingIClientController"/>
   <endpoint address="https://localhost:38866/ManagementController.svc" binding="basicHttpBinding" bindingConfiguration="BasicHttpBinding_MManagementController"_contract="IManagementController, IManagementController" name="BasicHttpBinding_ManagementController"/>
   <endpoint address="https://localhost:38866/RMSController.svc" binding="basicHttpBinding" bindingConfiguration="BasicHttpBinding_RMSController"_contract="IRMSController, IRMSController" name="BasicHttpBinding_RMSController"/>
   ```

5. By default, the endpoint address is pointed to localhost:38866, replace this with the primary controller service: https://<Actual IP of Primary Controller Service>:<Port Number> e.g. https://10.0.0.1:38866

   ```
   <add key="EnableRMSPortal" value="true" />
   ```
7. Open HyWorks Controller Management Console, and login with user credentials having super-administrator privileges
8. Go to System – Advanced Config
9. Locate configuration **Enable RMS Login** - Set it as **True**
10. Update the configuration
11. RMS link will now be displayed on HyWorks Management Console login page
12. User with appropriate rights will be able to access RMS Console.

How to Enable User Portal on HyWorks Management Console

1. Access HyWorks Controller Management Console server
2. Navigate to following folder:
   
   C:\Program Files (x86)\Accops\HyWorks\Mmc (Default installation directory of HyWorks Management Console)
3. Take backup of existing Web.config file

   ```
   <add key="EnableUserPortal" value="true" />
   ```
5. Save the Web.config file and restart IIS.
6. User Portal access link will be available on HyWorks Management Console
Prerequisite Installation and Configuration

Detailed information about prerequisites are provided in this section of document:

Installing .Net 4.7.2

HyWorks Controller v3.2-GA (v8493) or later will require .Net 4.7.2 and thus the same should be installed on Windows Servers prior to the installation of HyWorks Controller. Below reference article from Microsoft provides details of .Net version compatibility with different windows servers versions:

https://docs.microsoft.com/en-us/dotnet/framework/get-started/system-requirements

- **On Windows Server 2016**
  Windows servers 2016 comes preinstalled with .Net v4.6 and thus it will be required to download appropriate .Net installer from official Microsoft website and install on Server. Below is the download link for reference:
  https://support.microsoft.com/en-us/help/4054530/microsoft-net-framework-4-7-2-offline-installer-for-windows
  Installation process for .Net 4.7.2 is very simple as to download the offline package, run the setup and follow the default installation options.
  Once installed administrator can start configuring other prerequisites for HyWorks Controller installation.

- **On Windows 2012R2**
  Windows 2012 R2 requires the following windows updates to be installed on system prior to the installation of .Net 4.7.2. and thus, following flow of installation will be required:
  1. Install update **kb2919442**, prerequisite for update **kb2919355**
  2. Install update **kb2919355**
  3. Install **.Net 4.7.2**

  **Note**: HyWorks Controller deployment does not work on Windows 2012 or 2012-SP1. Minimum version Windows 2012R2 should be available with .Net 4.7.2 for HyWorks Controller installation.

- **On Windows 2008R2 (SP1 is must)**
  .Net 4.7.2 is supports minimum version of Windows 2008R2-SP1 and thus any existing Windows 2008R2 must be upgraded to SP1 first and then installed with .Net 4.7.2.
  To install and register .Net with IIS use the following steps:
  - Install SP1 update of Windows 2008R2 (if not having SP1 installed)
  - Install **.Net 4.7.2**
  - Once installation of Microsoft .Net 4.7.2 is completed, Open **Command** prompt with Administrator privileges
  - Run the command
    
    “C:\Windows\Microsoft.Net\Framework\v4.0.30319\aspnet_regiis.exe -iru”

Registering ASP.Net 4.0 post Web Server Role Addition

Accops HyWorks Controller Management Console requires appropriate application .Net pool to be added in IIS.

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After installing .Net 4.7.2 and configuring Web Server role in Windows 2008 R2-SP1 sometimes it does not register the .Net 4.0 pool in IIS. The below steps can be used to verify and configure appropriate .Net Pools.

**Verifying if appropriate .Net Pool Exists**
Follow the below steps to verify if appropriate .Net Pool exists on IIS:
1. Go to Start – Administrative Tools – Internet Information Services (IIS) Manager
2. Click on Application Pools displayed in left hand side inventory list
3. It will display all the application pools on the servers.
4. Verify if ASP.Net 4.0 pool is listed (Refer screen-shot below)

If the ASP.Net 4.0 pool is not listed, then use the below section to configure appropriate .Net Pool in IIS:

**Configure ASP.Net 4.0 Pools in IIS**
1. Open Command prompt with Administrator privileges
2. Run the command
   "C:\Windows\Microsoft.NET\Framework\v4.0.30319\aspnet_regiis.exe -iru"
3. Verify if command executed successfully, it should display the success status as per below screen-shot:

4. Verify the existence of appropriate pools as described in above section.
Preparing Microsoft SQL Server for HyWorks Deployment
It is very important to configure SQL Server correctly for supporting HyWorks Controller clustering. Following configurations should be done on SQL Servers:

1. Enable remote connections on SQL Server instance
2. Configure SQL server to listen on static port
3. Turn on the SQL Server Browser service

Assumption: SQL Server is already installed and ready for configurations.

Enable remote connections SQL Server Instance
Follow the below steps to configure SQL Server to allow remote connections:

1. Open SQL Management Studio – Connect to SQL Server to be configured as database server for HyWorks Controller
2. Right-click server name in the left pane and select Properties
3. Select Connections in the left pane
4. Make sure that checkbox “Allow remote connections to This server” is selected as it is shown in screen-shot below
Refer this Microsoft article [Enable Remote Connection on SQL Server](#) for reference and more details.

**Configure SQL express server to listen on static Port**

Static ports are being encouraged and must in HyWorks Configurations for security and ease of manageability reasons. Follow the below steps to configure SQL Server to use static TCP port:

1. Open SQL Server Configuration Manager
2. Click on “SQL Server Services” in the left pane.
3. In Right pane, note down the process Id of the SQL Server instance e.g. 116 in above image
4. Open command prompt and run the following command `netstat -ano | find /i <PID of SQL Server>`
   e.g. `netstat -ano | find /i "116"`. 
5. If the command does not show any result which means SQL Server is not using any static TCP port and should be configured to use one; as shown in above screenshot.

6. To enable SQL Server to use static port, in SQL Server Configuration Manager
   a. Click on SQL Server Network Configuration in the left pane
   b. Right-click on TCP/IP protocol
   c. Select option Enable

7. Restart SQL Server service and identify the process ID assigned to SQL service.

8. In the command prompt execute command: verify that SQL services are listening on any TCP port or not.
   netstat -ano | find /i <PID of SQL Server>
9. To configure a specific port - In SQL Server Configuration Manager
   a. Click on SQL Server Network Configuration in the left pane
   b. Right-click on **TCP/IP** protocol
   c. Select option **Properties**.
   d. Go to IP Address tab
   e. Scroll-down to **IPAll** section.
   f. Remove value for TCP Dynamic Ports (do not enter Zero 0 !!!)
   g. Enter the port 1433 for TCP Port

   ![TCP/IP Properties](image)

10. Restart SQL Server service. -> Identify new process ID assigned to SQL service and in the command, prompt execute command: to verify that SQL Service is now listening on configured TCP Port i.e. 1433.
   `netstat -ano | find /i “PID of SQL Server”`
11. At this stage, SQL Express is configured to listen on standard port 1433.

Turn on SQL Server Browser service

Follow the below steps to enable the SQL Server browser service:

1. Open SQL Server Configuration Manager and click on "SQL Server Services" in the left pane, right-click SQL Server Browser service and select Properties.

2. Go to Service tab and for Start Mode option change start type to Automatic.
3. Click Start button to start SQL Browser service
4. Confirm that SQL Server Browser service is up and running.

Database Configuration References
For detailed information on enabling remote connections in SQL Server 2008k2R2 and 2012KR2, refer the following articles


Microsoft Sync Framework v2.1
Required for HyWorks Clustering (If deployment does not include HyWorks Controller clustering, Microsoft Sync Framework will not be required)
Microsoft Sync Framework is required for data sync between primary server and secondary HyWorks Controller servers in cluster, following synchronization tools must be installed on both HyWorks Controller servers. The Synchronization tools can be downloaded from the following download link: https://www.microsoft.com/en-us/download/details.aspx?id=19502

Server Compatibility and Synchronization Tools:
The setup of Synchronization tools must be chosen as per the server OS which means if the HyWorks Controller is being installed on 64bit Windows 2012R2 then Synchronization tools x64 should be used where as if the Controller is being installed on 32-bit Windows 2008R2 then Synchronization tools x86 should be installed.

The installation of Microsoft Sync framework is very simple, download the setup from above specified URL and follow the installation wizard to complete the installation. Detailed steps are provided in the below section “Prerequisite-Install Microsoft Sync Framework 2.1”

Install Microsoft Sync Framework 2.1
For installing synchronization tools, please follow the below steps
1. Download Microsoft Sync Framework v2.1 Setup from the below location

2. Double click on setup file or Right-click and select option Open/ Run as Administrator
3. In Open Synchronization-v2.1-x64-ENU, click on Next button on Welcome screen

4. On **License Agreement** screen, select *I Agree* and click on **Next** button
5. Click on **Next** button on Confirm Installation screen

![Confirm Installation Screen](image1)

6. Wait for installation to finish

7. Click on **Close** button to close the Setup wizard after successful installation of Microsoft Synchronization Framework tools.

![Installation Complete Screen](image2)
Note:

➢ The Microsoft Synchronization Framework is required to be installed on both HyWorks Controller Servers
➢ Synchronization Framework must be installed before configuring controllers in cluster but can be installed before or after the HyWorks Controller.
CHAPTER 4

Troubleshooting

Installation Wizard should not be left unattended

HyPrint Installation Confirmation
During installation for the first time, setup may display confirmation dialog for the installation of HyPrint module and the setup will not proceed until it is being confirmed by user. Thus, Installation wizard should not be left unattended else it may wait for user confirmation and will not proceed.

Session Host or Monitoring Service Not Getting Started During installation
Sometimes on slow servers, the services being installed with HyWorks Session Host Server i.e. (Session Host Service and HyWorks Monitoring Service) does not get started in a timely manner during installation and thus the error is displayed. The error can be ignored, and services can be started post installation but if the setup is left unattended the setup will not proceed until the administrator acknowledges the error by clicking on OK button and thus the setup should not be left unattended.

Error ‘Appropriate .Net application pool in the IIS (NOT FOUND)’

The error is displayed while installing Accops HyWorks Management Console, though .Net 4.5 has been installed and ASP.Net is enabled in Windows 2008 R2 machine.

RESOLUTION
1. **Start** -> **Command** Prompt
2. Right click on it and select "**Run as Administrator**"
3. ‘cd’ to desired .Net 4.0 installation folder: Default path is:
   ```
   cd Windows\Microsoft.Net\Framework64\v4.0.30319
   ```
4. Run the following command:
   ```powershell
   aspnet_regiis.exe -iru
   ```

3. It will register the .Net 4.0 in application pool
4. Re-run the Accops HyWorks Controller Setup and installation should be successful.

**Error Service Could not be started during installation**
Sometimes when the server where HyWorks Controller/ Session Host servers are being installed, is not having enough resources, HyWorks services might fail to restart and during installation it will show the error and will wait for user input.

Resolution:
If error is displayed, click on **OK** button to proceed with installation and once installation is completed, go to Services - > Locate the HyWorks Services and start it manually if not already started.
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