Universal Controller 6.6.x

Installation, Upgrade, and Applying Maintenance

© 2019 by Stonebranch, Inc. All Rights Reserved.

1. Installation, Upgrade, and Applying Maintenance . . . 3
1.1 Installation, Upgrade, and Applying Maintenance - Overview . . . 4
1.2 Universal Controller Installation . . . 6
1.2.1 Pre-Installation Procedure . . . 7
1.2.1.1 Determining Space Requirements . . . 8
1.2.1.2 Installing Universal Controller Prerequisites . . . 9
1.2.1.2.1 Downloading Java Runtime Environment . . . 10
1.2.1.2.2 Installing Apache Tomcat . . . 11
1.2.1.2.3 Installing a Database . . . 17
1.2.1.3 Downloading Universal Controller Software . . . 22
1.2.2 Installing Universal Controller . . . 23
1.2.3 Installing Universal Bundled Controller on AIX . . . 40
1.2.4 Adding a Cluster Node . . . 54
1.3 Universal Controller Upgrade and Maintenance . . . 61
1.3.1 Upgrading Universal Controller from 5.2.0 . . . 62
1.3.2 Applying Maintenance to Universal Controller . . . 73
1.4 Starting and Stopping Universal Controller . . . 78
1.4.1 Starting and Stopping Universal Controller - UNIX and Windows . . . 79
1.4.2 Starting and Stopping Universal Bundled Controller on AIX . . . 81

Installation, Upgrade, and Applying Maintenance

Overview

Installation, Upgrade, and Applying Maintenance - Overview

Installation Instructions

Overview

Pre-Installation

Installing Universal Controller Prerequisites

Downloading Java Runtime Environment

Installing Apache Tomcat

Installing a Database

Installing Universal Controller

Installing Universal Bundled Controller on AIX

Adding a Cluster Node

Upgrade Instructions

Upgrading Universal Controller from 5.2.0

Applying Maintenance Instructions

Applying Maintenance to Universal Controller

Starting and Stopping Universal Controller

Overview

Starting and Stopping the Controller on UNIX and Windows

Starting and Stopping Universal Bundled Controller on AIX

The information on these pages also is located in the Universal Controller 6.6.x Installation, Upgrade, and Applying Maintenance.pdf.

Installation, Upgrade, and Applying Maintenance - Overview

- Installation, Upgrade, and Applying Maintenance
  - Installation
  - Upgrade
  - Applying Maintenance
- Database Permissions

Installation, Upgrade, and Applying Maintenance

There are separate procedures for installing, upgrading, and applying maintenance for Universal Controller 6.6.x.

Installation

Installation refers to the installation of Universal Controller 6.6.x on a machine with any supported platform that does not already contain an installed Controller.

If you are installing Universal Controller for the first time, see Universal Controller Installation for instructions.

Upgrade

Upgrading to Universal Controller 6.6.x refers to the increase of its currently installed 5.2.x version to a 6.6.x version (for example, upgrading Controller 5.2.0.10 to Controller 6.6.0.0).

You cannot upgrade to Controller 6.6.x from versions prior to 5.2.x (for example, 5.1.1).

If you are upgrading from Universal Controller 5.2.x to Universal Controller 6.6.x, see Upgrading Universal Controller from 5.2.0 for instructions.

Note
To increase a currently installed 6.1.x or later release of the Controller to a 6.6.x release, you do not have to perform an upgrade; you only have to apply maintenance to the 6.1.x or later release. (The procedures for applying maintenance differ from the procedures for upgrading.)

Applying Maintenance

For Universal Controller 6.6.x, applying maintenance refers to the increase from a currently installed 6.1.x or later release of the Controller to a 6.6.x release of the Controller (for example, increase Controller 6.1.3.1 to Controller 6.6.0.0).

If you are applying maintenance to your version of Universal Controller, see Applying Maintenance to Universal Controller.

Note
To increase a Controller 5.2.x version to Controller 6.6.x, you must perform an upgrade. (The procedures for upgrading differ from the procedures for applying maintenance.)

You cannot upgrade to Controller 6.6.x from versions prior to 5.2.x (for example, 5.1.1).

Database Permissions

In order to install or perform upgrades of Universal Controller, the database user configured for the Controller will require **DDL** (**D**ata **D**efinition **L**anguage) permission in the database during the install or upgrade.

Once the install or upgrade has been completed successfully, the configured database user requires only **DML** (**D**ata **M**anipulation **L**anguage) permissions for running the Controller.

Universal Controller Installation

- Overview
  - Upgrade and Applying Maintenance
- Database Permissions

Overview

Universal Controller is a Java web application running in a Tomcat web container.

For this reason, the Universal Controller software and the procedure for installing Universal Controller on UNIX or Windows is basically the same.

> **Note**
> This installation procedure does not include the installation of Java, Tomcat, or a database; however, they all are prerequisites.

The Universal Controller software and procedure for installing Universal Bundled Controller on AIX is different.

> **Note**
> This installation procedure includes installation of Apache Tomcat, but it does not include the installation of Java or a database; however, they all are prerequisites.

Upgrade and Applying Maintenance

If you are upgrading to Universal Controller 6.6.x from Universal Controller 5.2.x, see Upgrading Universal Controller from 5.2.0 for instructions.

If you are applying maintenance to a Universal Controller 6.1.x or later installation to increase it to a 6.6.x release, see Applying Maintenance to Universal Controller for instructions.

Database Permissions

In order to install or perform upgrades of Universal Controller, the database user configured for the Controller will require **DDL** (**D**ata **D**efinition **L**anguage) permission in the database during the install or upgrade.

Once the install or upgrade has been completed successfully, the configured database user requires only **DML** (**D**ata **M**anipulation **L**anguage) permissions for running the Controller.

Pre-Installation Procedure

Overview

Before you install Universal Controller or Universal Bundled Controller on AIX, you must perform the following pre-installation procedure:

Step 1	Determine the space requirements for Universal Controller software and the Universal Controller database.
Step 2	Install all required Universal Controller prerequisites.
Step 3	Download the platform-specific Universal Controller distribution file from the Stonebranch Customer Portal.

Note
You can install the Controller before, during, or after installation of Universal Agent.

Determining Space Requirements

- Overview
- Controller Space Requirements
- Database Space Requirements
  - Calculating Space Requirements
  - Output Retrieval

Overview

The following space requirements must be determined for the Controller and its database.

Controller Space Requirements

The Universal Controller war file is approximately 110MB compressed and 200MB uncompressed, using a total of approximately 310MB of space when fully deployed.

However, the space requirements for the Controller are driven largely by logging. Logging requirements are based on the log levels selected in the Log Level and Platform Log Level Universal Controller system properties.

A minimum 2GB of space is recommended for logging and other operations that require the Controller file system, such as bulk (and list) import/export.

The Log File Retention Period in Days Universal Controller system property lets you specify the number of days that a Controller log file (and an Agent log file) is retained before it is purged. The default is 5 days.

Database Space Requirements

Each type of database software (MySQL, Microsoft SQL Server, Oracle) takes up different amounts of space. However, the space required for saved Controller data is the same; that is, for example, 1,000 tasks consume no more space in MySQL than they do in Oracle.

Calculating Space Requirements

Following the initialization of the Controller database, the initial table space size will be approximately 60MB.

Based on calculations using data from all task types, each Controller task instance consumes approximately 10KB of database space. You should estimate space requirements for your data based on your expected number of task executions per day and the duration for retaining history and activity data before purging.

Output Retrieval

An Agent always caches output. Output is stored in the database only if you do one or more of the following:

- Select Automatic Output Retrieval for a task.
- Create Email Notifications with output attachments for task.
- Retrieve output for a task instance.

A retrieved output file of 1K (for example) will require 2KB to 2.5KB of space in the database.

Installing Universal Controller Prerequisites

Before installing Universal Controller, on either Windows or UNIX (both Linux and AIX), you first must install the following prerequisites:

1. Java Runtime Environment
2. Apache Tomcat
3. Database

Note
If you will be installing Universal Bundled Controller on AIX, you do not need to install Apache Tomcat.

Downloading Java Runtime Environment

Introduction

You must download a Java Runtime Environment (JRE) appropriate for your platform:

Operating System	JRE	Supported Level
Windows, UNIX (Linux)	Oracle JRE	Level 8
Windows, UNIX (Linux)	Open JRE	Level 8
UNIX (AIX)	IBM JRE	Level 8

Oracle JRE

To download the Oracle Java Runtime Environment (JRE) for Windows and UNIX (Linux), access the Oracle site for Java JREs and download the appropriate package for your platform:

http://www.oracle.com/technetwork/java/javase/downloads/index.html

Open JRE

To download Red Hat's implementation of OpenJDK, a free and open source implementation of the Java Platform, Standard Edition (Java SE), access Red Hat's download site and download the appropriate package:

https://developers.redhat.com/products/openjdk/download/

Note
If Universal Controller produces an exception while exporting a dashboard widget or generating a scheduled chart report, a required dependency may not be installed.

IBM JRE

To download the IBM Java Runtime Environment (JRE) for UNIX (AIX), access the IBM site for Java JREs and download the appropriate package for your platform:

http://www-01.ibm.com/support/docview.wss?uid=isg3T1022644

Installing Apache Tomcat

- Install Apache Tomcat
- Start and Validate Apache Tomcat
- Troubleshooting
  - Tomcat Post Limit: STATUS_MAX_POST_SIZE_EXCEEDED
  - Special Characters Not Displaying Correctly

Note
Apache Tomcat version 7.0.x, 8.0.x, and 8.5.x is supported.

Install Apache Tomcat

Perform the following steps to install Apache Tomcat (download and installation procedure for Apache Tomcat may vary a bit for each platform):

Step 1	Select an appropriate method of installation: **Windows** We recommend using the GUI installer to create the Apache Tomcat Service: 1. Download the "32-bit/64-bit Windows Service Installer" from Tomcat 7.0.x or Tomcat 8.0.x / 8.5.x. 2. Follow the instructions to install the package. **Windows or Linux/Unix** Download a tar.gz or zip package that you unzip into a directory: 1. Download an appropriate package from Tomcat 7.0.x or Tomcat 8.0.x / 8.5.x. 2. Follow the instructions to unzip the appropriate package (tar.gz or zip) into a directory on your file system. **Linux/Unix: Redhat and Centos distributions** Instead of downloading a tar.gz or zip package, you can use the **yum** installer.
Step 2	In order to accommodate large workloads, Universal Controller requires that you configure the Java heap size options using the CATALINA_OPTS environment variable. The following table outlines the minimum recommended configuration.

AIX	`CATALINA_OPTS="-Xms512m -Xmx2048m"`
z/Linux	`CATALINA_OPTS="-Xms512m -Xmx2048m -Xjit:optLevel=noOpt"`
All Other Platforms	`CATALINA_OPTS="-Xms512m -Xmx2048m -XX:MaxPermSize=256m"` **Note** Updating MaxPermSize= is not required for Java 8.

If you have installed Tomcat as a service on Windows, see Windows Service, below; otherwise, see **All Platforms**:

All Platforms

A recommended way to set the CATALINA_OPTS environment variable is to use the optional `setenv` script.

The script is placed into either the CATALINA_BASE/bin or CATALINA_HOME/bin directory and is named `setenv.bat` (on Windows) or `setenv.sh` (on Linux/Unix). The file must be readable.

Note
The CATALINA_BASE environment variable specifies location of the root directory of the "active configuration" of Tomcat. It is optional. It defaults to be equal to CATALINA_HOME.

By default, the `setenv` script file is absent. If the script file is present in both CATALINA_BASE and CATALINA_HOME, the file in CATALINA_BASE is preferred.

For example, to configure the CATALINA_OPTS environment variable for Java 8, you can create the following script file:

On Windows, `%CATALINA_BASE%\bin\setenv.bat`:

```
set "CATALINA_OPTS=-Xms512m -Xmx2048m"
```

On Linux/Unix, `$CATALINA_BASE/bin/setenv.sh`:

```
CATALINA_OPTS="-Xms512m -Xmx2048m"
```

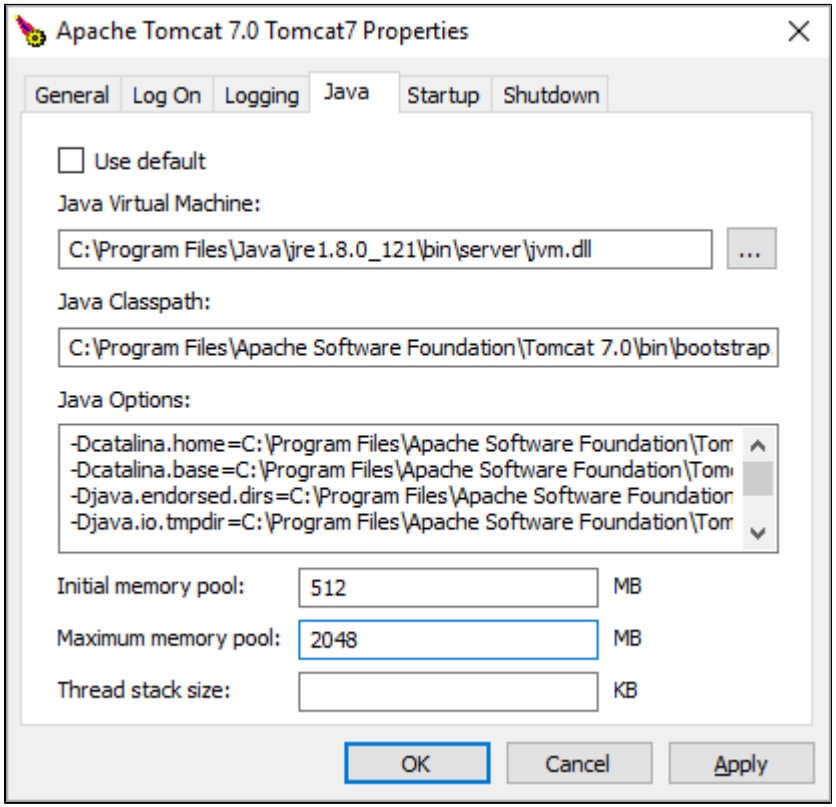
For additional Tomcat configuration details, including CATALINA_OPTS, see RUNNING.txt.

Windows Service

If you installed Tomcat as a Windows service, you can set values using the `$CATALINA_HOME\bin\tomcatw.exe` GUI tool.

Enter the parameters as follows (for Tomcat 7.0.x, Tomcat 8.0.x, or Tomcat 8.5.x):

- Initial memory pool = minimum heap size (Xms)
- Maximum memory pool = Maximum heap size (Xmx)

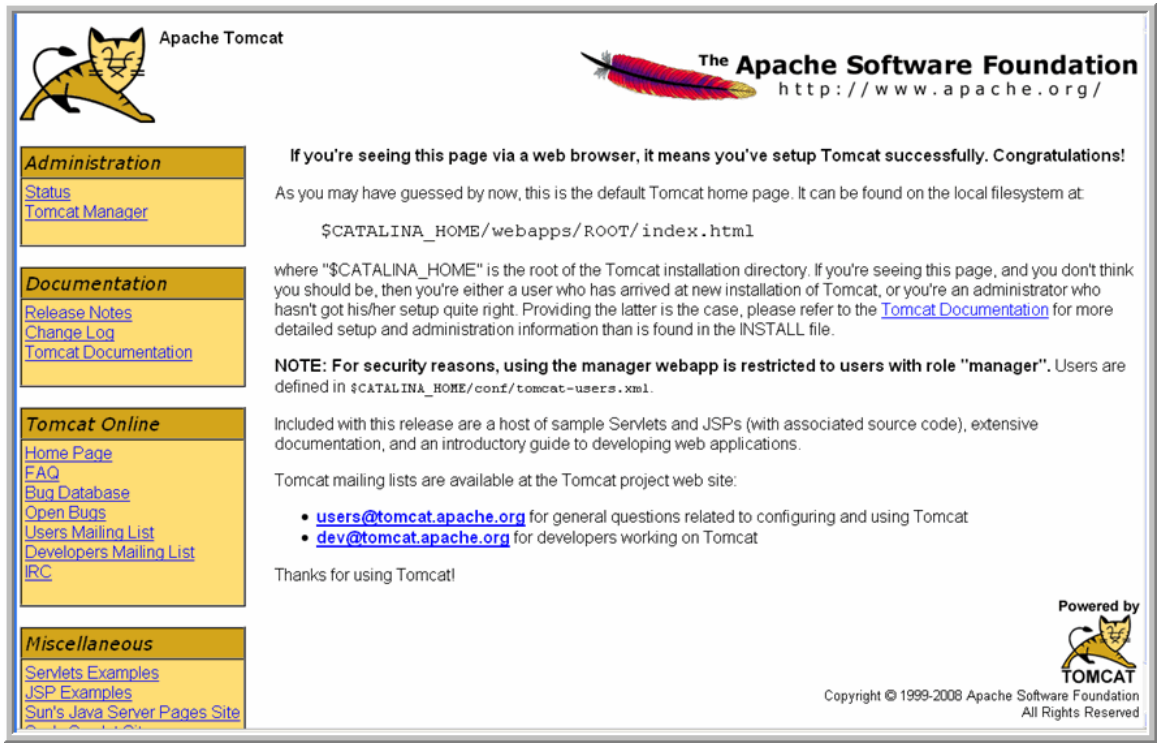


Note
Later, after you start Tomcat and log in to the Controller, you can validate these settings by running the **Memory Usage** operation, as follows:

1. From the **Administration** navigation pane, select **Configuration > Server Operations**.
2. Run the **Memory Usage** operation. The min and max numbers on the top line (Heap) should be similar to the above settings.

Start and Validate Apache Tomcat

Perform the following steps to start and validate Apache Tomcat:

Step 1	Tomcat is normally run as a system service or daemon. You can start Tomcat using the standard method for your operating system or by using a script, as follows: **Windows** Use Windows Services to start Tomcat or start Tomcat from the command line as follows: `net start <name of Tomcat service>`. **Linux** Start the Tomcat daemon using the script placed in the `/etc/init.d` directory for Tomcat: `service <name of Tomcat service> start`. **Windows or Linux** Start the service using the `$CATALINA_HOME/bin/startup.bat` or `$CATALINA_HOME/bin/startup.sh` scripts.
Step 2	Open a browser and go to the following URL: http://localhost:8080.
Step 3	The following screen displays, verifying that you have successfully installed and started Tomcat: 

Troubleshooting

Tomcat Post Limit: STATUS_MAX_POST_SIZE_EXCEEDED

Problem

The following error message displays:

```
The server did not receive the data that was sent to it. Please see the documentation for isc.RPCResponse.STATUS_MAX_POST_SIZE_EXCEEDED
```

Resolution

Remove the post limit by specifying the following attribute on the **<Connector>** element in **`conf/server.xml`**:

`maxPostSize="-1"` |

Special Characters Not Displaying Correctly

Problem

Some special characters not getting displayed correctly in your browser GUI.

Resolution

Tomcat on Windows requires you to define code page UTF-8 as the default code page for war files.

To do this, add the following to the Java options statement just as you did with the memory parameter:

```
-Dfile.encoding=UTF8
```

Installing a Database

- Overview
  - Database Permissions
- Database Management Systems
  - MySQL
  - Microsoft SQL Server
  - Oracle

Overview

Universal Controller can use a database space of an existing database or you can install a database specifically for the Controller.

We recommend an initial size of 100MB.

Note
In a High Availability environment, each cluster node connects to the same database.

Database Permissions

In order to install or perform upgrades of Universal Controller, the database user configured for the Controller will require **DDL** (**D**ata **D**efinition **L**anguage) permission in the database during the install or upgrade.

Once the install or upgrade has been completed successfully, the configured database user requires only **DML** (**D**ata **M**anipulation **L**anguage) permissions for running the Controller.

Database Management Systems

The following database management systems are supported:

- MySQL
- Microsoft SQL Server
- Oracle

MySQL

Note
MySQL versions 5.6.x, 5.7.x, and 8.0.x are supported.

Step 1	Download MySQL installation instructions.

Step 2	Download MySQL (Windows only). • For Windows, select Windows (x86, 32-bit), MSI Installer • For Unix and Linux, you can use a tar.gz download or select a systems package installer appropriate for your environment, such as Yum.
Step 3	Install MySQL as per the instructions.
Step 4	Make a note of the user ID and password to be used later when installing the Controller.
Step 5	The database will be created automatically when you select MySQL during the Controller installation process.

MySQL Options

The following enhancements can be made to your MySQL database.

Speeding Up MySQL Performance

For Windows installations, you can speed up MySQL performance by adding the following parameter to the appropriate `MySQL.ini` file:

```
innodb_flush_log_at_trx_commit=0
```

For more information about this parameter, see the MySQL documentation:

- http://dev.mysql.com/doc/refman/5.6/en/innodb-parameters.html#sysvar_innodb_flush_log_at_trx_commit
- http://dev.mysql.com/doc/refman/5.7/en/innodb-parameters.html#sysvar_innodb_flush_log_at_trx_commit
- http://dev.mysql.com/doc/refman/8.0/en/innodb-parameters.html#sysvar_innodb_flush_log_at_trx_commit

Setting the MySQL max_allowed_packet Configuration Variable

A communication packet is a single SQL statement sent to the MySQL server, a single row that is sent to the client, or a binary log event sent from a master replication server to a slave.

If you want the Controller to handle big packets, you must increase the MySQL **max_allowed_packet** configuration variable on the database server.

For detailed information about this variable, refer to:

- MySQL 5.6.x reference manual
- MySQL 5.7.x reference manual
- MySQL 8.0.x reference manual

MySQL SSL Configuration

If you use SSL for JDBC communication to your MySQL environment, some additional configuration is required (depending on your needs).

To use SSL for encryption only and bypass verification of the MySQL server certificate, add the following to the opswise.properties configuration file:

```
opswise.db.url.append.properties=&verifyServerCertificate=false&useSSL=true
```

To use SSL for encryption and verify the MySQL server certificate, add the following to the opswise.properties configuration file AND import the MySQL server certificate CA into the Universal Controller Truststore:

```
opswise.db.url.append.properties=&useSSL=true
```

Microsoft SQL Server

> **Note**
> Microsoft SQL Server versions 2008, 2012, 2014, 2016, and 2017 are supported.

Step 1	Download and install MS SQL Server as per the Microsoft documentation.
Step 2	Create the Controller database. You can use any legal name, but we recommend the name **opswise**. **Important** You must use a ***case-insensitive*** collation.
Step 3	Make a note of the userid and password to be used later when installing the Controller.

The Unicode translation property can be changed to specify that prepared parameters for character data are sent as ASCII or Multi-byte Character Set (MBCS) instead of Unicode:

`jdbc:sqlserver://localhost:1433;sendStringParametersAsUnicode=false`

(The default value is **`true`**.)

Oracle

> **Note**
> Oracle versions 10g, 11g, 12c, and 18c are supported.

Step 1	Download and install Oracle as per the Oracle documentation.
Step 2	Create the Controller database. You can use any legal name, but we recommend the name **opswise**.

Step 3	Make a note of the userid and password to be used later when installing the Controller.

If PDB (Pluggable Database) is being used for the Oracle 12c Controller database, the JDBC URL should be used in EZCONNECT format and point to the PDB service, not the database SID.

For example:

`jdbc:oracle:thin:@//dbhost:1521/pdbopswise.userdomain`

Oracle Options

The following enhancements can be made to your Oracle database.

Setting open_cursors Value for Large Imports

To facilitate large imports on Oracle, specify the maximum number of cursors that can be open by setting the **`open_cursors`** value to 1000.

(The cursors are used only during the import; they then are closed.)

Checking the Current Value of open_cursors

To check the current value for maximum open cursors, issue the following **sql*plus** utility command:

```
show parameter open_cursors
```

A listing similar to the following will display:

```
SQL> show parameter open_cursors;

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
open_cursors                         integer     1000
```

Setting a New Value for open_cursors

You can temporarily set the **`open_cursors`** value with the following SQL:

```
alter system set open_cursors=1000
```

To make a permanent change, you must set the **`open_cursors`** value in the initialization parameters file.

Note
If you do not set **`open_cursors`** to 1000, you could receive the following error message during large imports:

```
ORA-01000: maximum open cursors exceeded
```

Character Sets

Universal Controller does not stipulate a requirement for the Oracle database character set; for multilingual support, you can use the default Unicode character set of AL32UTF8.

https://docs.oracle.com/database/121/NLSPG/ch6unicode.htm#NLSPG317

Block Size

A block size of 8K is optimal for most systems, including Universal Controller.

https://docs.oracle.com/cd/B19306_01/server.102/b14211/iodesign.htm#i19636

Downloading Universal Controller Software

- Overview
  - Versioning
- Downloading Current Products Software

Overview

This page tells you how to download the current Universal Controller 6.6.x software from the Stonebranch Customer Portal.

Versioning

Universal Automation Center software (Universal Controller and Universal Agent) packages are labeled with four numeric identifiers: Version.Release.Modification.Maintenance.

For example, for Universal Controller 6.6.0.0:

- 6 = Version 6
- 6 = Release 6
- 0 = Modification Level 0
- 0 = Maintenance Level 0

Downloading Current Products Software

To download the Universal Controller 6.6.x software:

Step 1	Log in to the Stonebranch Customer Portal. If you do not have a login, you can request one at support@stonebranch.com.
Step 2	Click the **Software Downloads** link.
Step 3	Click the **Universal Controller** link.
Step 4	Click the Universal Controller package link appropriate for your platform.
Step 5	Click **Save File** and browse to your save location. You can then use the software to install, upgrade, or apply maintenance to the Controller.

Installing Universal Controller

- Introduction
- Installation Procedure
- Unpack the Universal Controller Distribution File
- Install the Controller
  - Command Line Switches
  - Examples
- Deploy the Controller
- Update the Universal Controller Start-up Properties (opswise.properties)
- Verify the Installation
- Apply the License Key
  - License Information
- Enable LDAP Synchronization
- Configure System Notifications
  - System Notifications for License Violations and Expirations
  - System Notification for System Operations
  - System Notification for Data Backup / Purge Operations

Introduction

This page tells you how to install Universal Controller.

The procedure is the same, unless otherwise noted, for both Windows and UNIX (Linux or AIX).

It assumes you already have performed all required pre-installation procedures:

- Determined space requirements
- Installed all prerequisites.
- Downloaded a Universal Controller distribution file.

Installation Procedure

To install Universal Controller:

1	Unpack the Downloaded Distribution File
2	Install the Controller
3	Deploy the Controller
4	Update the Universal Controller Start-up Properties
5	Verify the Installation
6	Apply the License Key
7	Enable LDAP Synchronization

8	Configure System Notifications

Unpack the Universal Controller Distribution File

To unpack the Universal Controller distribution file, use the following method appropriate for your platform:

Linux/Unix	`tar -xvf universal-controller-N.N.N.N.tar`
Windows	Use an appropriate archiving / unzipping product.

Install the Controller

To install the Controller, issue the following command that is appropriate for your platform:

Linux	`> sh install-controller.sh`
Windows	`> install-controller.bat`

The installation process writes the war file (**`universal-controller-N.N.N.N-build.N.war`**) to the Tomcat installation directory and renames it **`opswise.war`**.

You must include command line switches that specify information the Controller needs to access the Tomcat installation directory, the war file, and the database. You can include additional command line switches, but they are not required.

If a required command line switch is missing from the command line, an error message will identify it during the installation process.

The Controller installation process writes the values for some command line switches to the Universal Controller start-up properties file, **`opswise.properties`** (see the table, below). For any of those command line switches that are not required and, in fact, are not included on the command line, the Controller installation process writes their default value to **`opswise.properties`**.

Command Line Switches

The following table describes the command line switches for the Controller installation process and identifies which are required.

For command line switches that have their value written to the Universal Controller start-up properties file, **`opswise.properties`**, the table also identifies the property in that file to which the value is written.

> **Note**
> All command line switches are case-sensitive.

Command Line Switch	Description	Default
`--controller-file`	Full path of the Universal Controller war file (**`universal-controller-N.N.N.N-build.N.war`**) from the downloaded Universal Controller package.	none
`--dbname`	Universal Controller database name.	opswise
`--dbpass`	Database user's password.	none

<table>
<tr>
<td><code>--dburl</code></td>
<td>JDBC connect URL.

Format: <code>jdbc:[database type]://localhost</code>

Examples (for MS SQLServer and Oracle, <code>opswise</code> is the database name):

<table>
<tr><td>MySQL</td><td><code>jdbc:mysql://localhost:3306/</code></td></tr>
<tr><td>MS SQL Server</td><td><code>jdbc:sqlserver://localhost:1433;DatabaseName=opswise</code></td></tr>
<tr><td>MS SQL Server JTDS</td><td><code>jdbc:jtds:sqlserver://localhost:1433/opswise</code></td></tr>
<tr><td>Oracle</td><td><code>jdbc:oracle:thin:@//localhost:1521/ServiceName</code>
or
<code>jdbc:oracle:thin:@localhost:1521:XE</code></td></tr>
</table>

Note
Enclose the URL in quotation marks to guard against any special characters (for example: ; > < &) which are treated by the shell uniquely.

Unix
Enclose the URL in single quotation marks; for example:
<code>'jdbc:sqlserver://dbserver.local;instanceName=IN01;DatabaseName=OpswiseDB'</code>
Windows
Enclose the URL in double quotation marks; for example:
<code>"jdbc:sqlserver://dbserver.local;instanceName=IN01;DatabaseName=OpswiseDB"</code>

Refer to the jdbc documentation from your database supplier for specific jdbc driver URL parameters or options that might be needed for your environment. You may want to consult with your local DBA to discuss these parameters and options.

Refer to Installing a Database in this documentation for more information about suggested connection parameters, database configuration, and setup.</td>
<td>jdbc:mysql://localhost:3306/</td>
</tr>
<tr>
<td><code>--dbuser</code></td>
<td>Database user name.</td>
<td>none</td>
</tr>
</table>

`--rdbms`	Database type. Valid values are: • mysql • sqlserver • sqlserver-jtds • oracle ***** --rdbms ***is*** required if --dburl is used in the command.	mysql
`--tomcat-dir`	Path to the Tomcat installation directory (contains the directories:`/bin`, `/conf`, `/logs`, `webapps`). **Note** Enclose the path in quotes to guard against spaces or any special characters (for example: ; > < &), which are treated by the shell uniquely.	none

Examples

Shown below are sample commands for installing the Controller on Linux and Windows platforms, using defaults for the database:

Linux

```
sh install-controller.sh --tomcat-dir ~/tomcat --controller-file ./universal-controller-N.N.N.N-build.N.war --dbuser root --dbpass
userpass
```

Windows

```
install-controller.bat --tomcat-dir "c:\Program Files\Apache Software Foundation\Tomcat 7.0" --controller-file
universal-controller-N.N.N.N-build.N.war --dbuser root --dbpass userpass
```

Note
In the Tomcat directory (--tomcat-dir), when quoting the directory is necessary due to spaces, do not use a single backslash before the ending quotation mark; use either a double backslash or no backslash to avoid the command shell from treating \" as an escape character.

Deploy the Controller

In this procedure, you will start Tomcat, which starts the Controller and builds your database tables. This process takes several minutes. When it is complete, the Controller is started and ready to

use.

If Tomcat already was running when you installed the Controller, you do not need to stop and restart it; this process will occur automatically after you start the installation.

Step 1 Start Tomcat as follows:

Linux
Start the Tomcat daemon using the script placed in the **`/etc/init.d`** directory for Tomcat.

```
service [name of Tomcat service] start
```

Windows
We recommend you use Windows Services to start Tomcat. Or, you can start Tomcat from the command line as follows:

```
net start [name of Tomcat service]
```

Linux or Windows
You can start the service using the **`$CATALINA_HOME/bin/startup.bat`** or **`$CATALINA_HOME/bin/startup.sh`** scripts.

Step 2

During this initial startup, the Controller builds the database tables, a process that takes several minutes. You can view details in the Tomcat window or monitor the Controller log, as described below:

Linux/Unix
Users can tail the `opswise.log` to monitor the deployment process, as follows:

```
tail -f $TOMCAT_DIR/opswise_logs/opswise.log
```

Windows
Users can use a third-party tailing utility or open the log file using Notepad or other editor and scroll to the bottom to view the latest activity.

```
$TOMCAT_DIR\opswise_logs\opswise.log
```

Do not continue until you see output in the log similar to the following:

```
2014-09-15-11:16:17:774 -0400   INFO [Ops.Cluster.Monitor.0] Cluster Monitor / ClusterWatchDog started (16951472)
2014-09-15-11:16:17:778 -0400   INFO [Ops.Cluster.Monitor.0] No active node found. sb-server:8080-ops6100 becoming Active node.
2014-09-15-11:16:17:778 -0400   INFO [Ops.Cluster.Monitor.0] Loading time zones
2014-09-15-11:16:17:810 -0400   INFO [Ops.Cluster.Monitor.0] Setting System time zone to "America/New_York"
2014-09-15-11:16:17:810 -0400   INFO [Ops.Cluster.Monitor.0] Initialize PubSubController
2014-09-15-11:16:17:813 -0400   INFO [Ops.Cluster.Monitor.0] PubSubController Active Start Load: 0 Subscriptions
2014-09-15-11:16:17:813 -0400   INFO [Ops.Cluster.Monitor.0] Server is now Running in Active mode. Previous mode was Passive
2014-09-15-11:16:17:813 -0400   INFO [Ops.Cluster.Monitor.0] Setting server to ACTIVE.
2014-09-15-11:16:17:814 -0400   INFO [Ops.Cluster.Monitor.0] Releasing lock and ending transaction
2014-09-15-11:16:18:147 -0400   INFO [Ops.Cluster.Monitor.0] 617 database statements took 0 Seconds
2014-09-15-11:16:18:149 -0400   INFO [Ops.Cluster.Monitor.0] Lock released and transaction ended
2014-09-15-11:16:18:149 -0400   INFO [Ops.Cluster.Monitor.0] Creating OmsServerWatchDog
2014-09-15-11:16:18:150 -0400   INFO [Ops.Cluster.Monitor.0] Creating AgentWatchDog
2014-09-15-11:16:18:150 -0400   INFO [Ops.Cluster.Monitor.0] Creating ApplicationWatchDog
```

Step 3

When you see the following, the Controller is ready:

- **INFO [Ops.Cluster.Monitor.0] Server is now Running in Active mode. Previous mode was Passive**
- **INFO [Ops.Cluster.Monitor.0] Setting server to ACTIVE.**

You now have completed the install process and the Controller is running.

Update the Universal Controller Start-up Properties (opswise.properties)

For AIX and z/Linux only

Follow this procedure to change two default values in the Universal Controller start-up properties file, **opswise.properties**, which is read by the Controller.

(The **opswise.properties** file resides in **<tomcat directory>/conf**).

Step 1	Change the following two properties from their default value to the IBM AIX value:
	• **opswise.trustmanager.algorithm=** (Java trust manager algorithm)
	  • Default value = SunX509
	  • IBM AIX = IbmX509
	• **opswise.trustmanager.provider=** (Java trust manager provider)
	  • Default value = SunJSSE
	  • IBM AIX value = IBMJSSE2

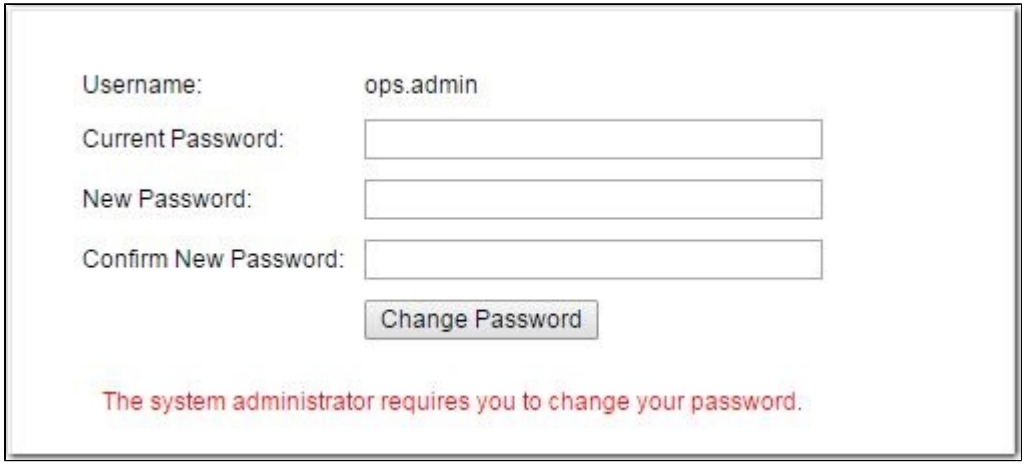
Step 2	Restart Tomcat.

Verify the Installation

To make sure the Controller is installed, running, and communication with Universal Agent and Universal Message Service (OMS):

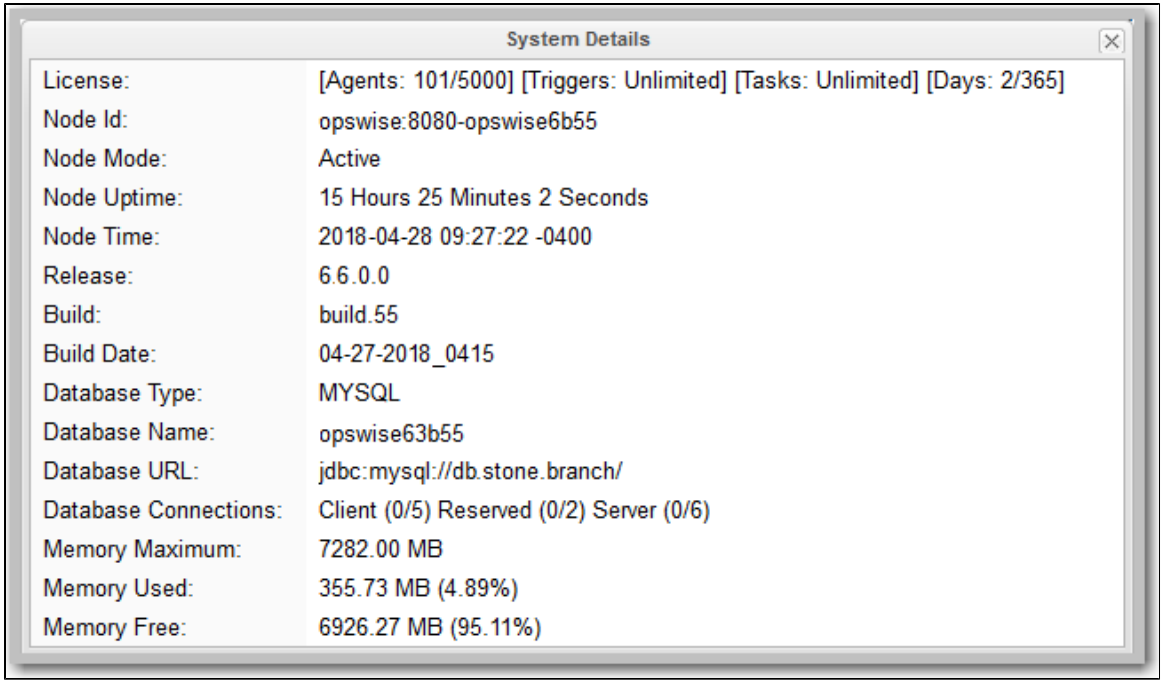
Step 1	Start the Controller.
Step 2	From your browser, access the Universal Controller user interface. `http://localhost:8080/opswise` `localhost` represents the machine name where you installed the server.

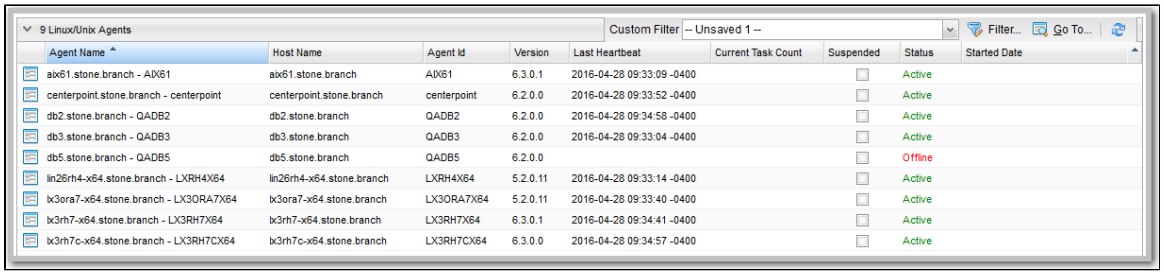
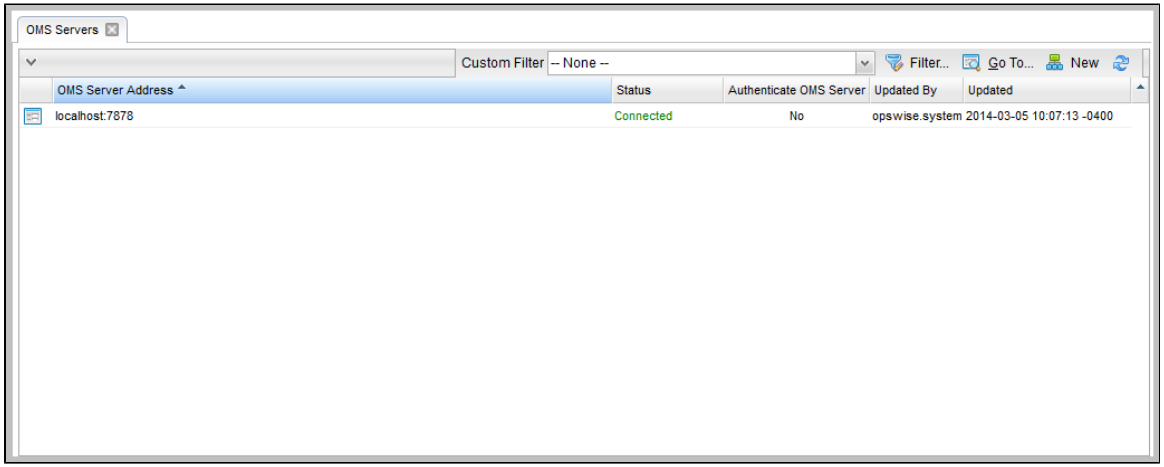
Step 3 Log in with user **`ops.admin`** and no password. A Change Password dialog displays.



Step 4 Enter a password in the **New Password** and **Confirm New Password** fields (the **Current Password** field should remain empty) and click **Change Password**. The Universal Controller Home Dashboard displays.

Step 5 The **System Details** Widget provides current system information. Check the Release information to verify that the latest version number is displayed, as shown in the following example.



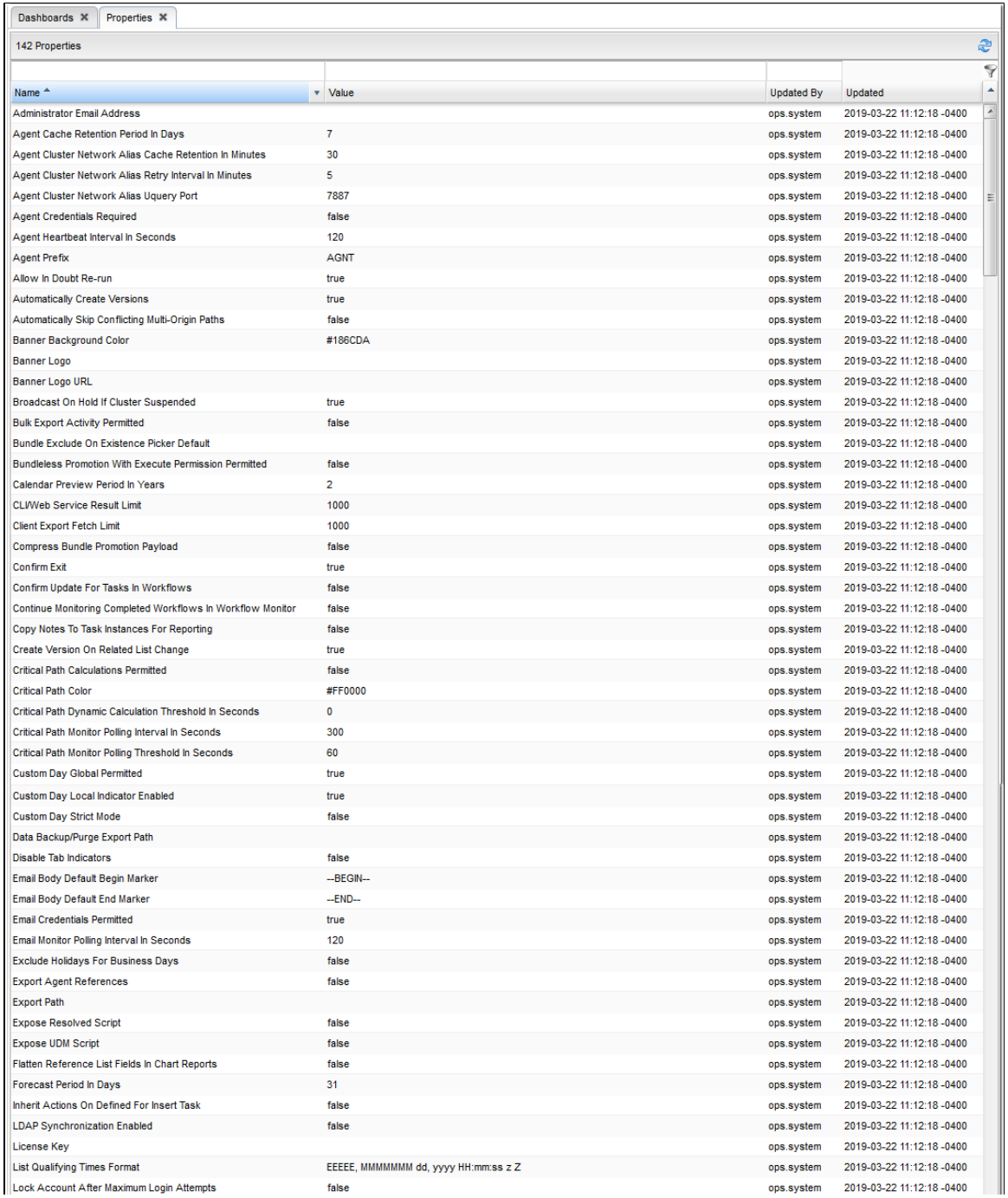
Step 6	From the **Agents and Connections** navigation pane, select **Agents > All Agents** or **Agents > <type of Agent>**. You will see a list similar to the following example. Make sure the **Status** of the Agent is **Active**.  9 Linux/Unix Agents — Custom Filter: -- Unsaved 1 -- — Filter... Go To... Agent Name | Host Name | Agent Id | Version | Last Heartbeat | Current Task Count | Suspended | Status | Started Date aix61.stone.branch - AIX61 | aix61.stone.branch | AIX61 | 6.3.0.1 | 2016-04-28 09:33:09 -0400 | | | Active | centerpoint.stone.branch - centerpoint | centerpoint.stone.branch | centerpoint | 6.2.0.0 | 2016-04-28 09:33:52 -0400 | | | Active | db2.stone.branch - QADB2 | db2.stone.branch | QADB2 | 6.2.0.0 | 2016-04-28 09:34:58 -0400 | | | Active | db3.stone.branch - QADB3 | db3.stone.branch | QADB3 | 6.2.0.0 | 2016-04-28 09:33:04 -0400 | | | Active | db5.stone.branch - QADB5 | db5.stone.branch | QADB5 | 6.2.0.0 | | | | Offline | lin26rh4-x64.stone.branch - LXRH4X64 | lin26rh4-x64.stone.branch | LXRH4X64 | 5.2.0.11 | 2016-04-28 09:33:14 -0400 | | | Active | lx3ora7-x64.stone.branch - LX3ORA7X64 | lx3ora7-x64.stone.branch | LX3ORA7X64 | 5.2.0.11 | 2016-04-28 09:33:40 -0400 | | | Active | lx3rh7-x64.stone.branch - LX3RH7X64 | lx3rh7-x64.stone.branch | LX3RH7X64 | 6.3.0.1 | 2016-04-28 09:34:41 -0400 | | | Active | lx3rh7c-x64.stone.branch - LX3RH7CX64 | lx3rh7c-x64.stone.branch | LX3RH7CX64 | 6.3.0.0 | 2016-04-28 09:34:57 -0400 | | | Active |
Step 7	From the **Agents and Connections** navigation pane, select **System > OMS Servers**. You will see a list similar to the following example. Make sure the **Status** of the OMS Servers are **Connected**.  OMS Servers — Custom Filter: -- None -- — Filter... Go To... New OMS Server Address | Status | Authenticate OMS Server | Updated By | Updated localhost:7878 | Connected | No | opswise.system | 2014-03-05 10:07:13 -0400
Step 8	For more information about these components in the Universal Controller user interface, see: • Agents • OMS Servers

To get started using the Controller and become familiar with its features, we recommend you spend some time going through the Tutorials.

Apply the License Key

Although you do not normally need to enter a license key immediately after installation, at some point you will need to follow these steps to enter your key:

Step 1	From the Administration navigation pane, select **Configuration > Properties**. The Properties list displays.

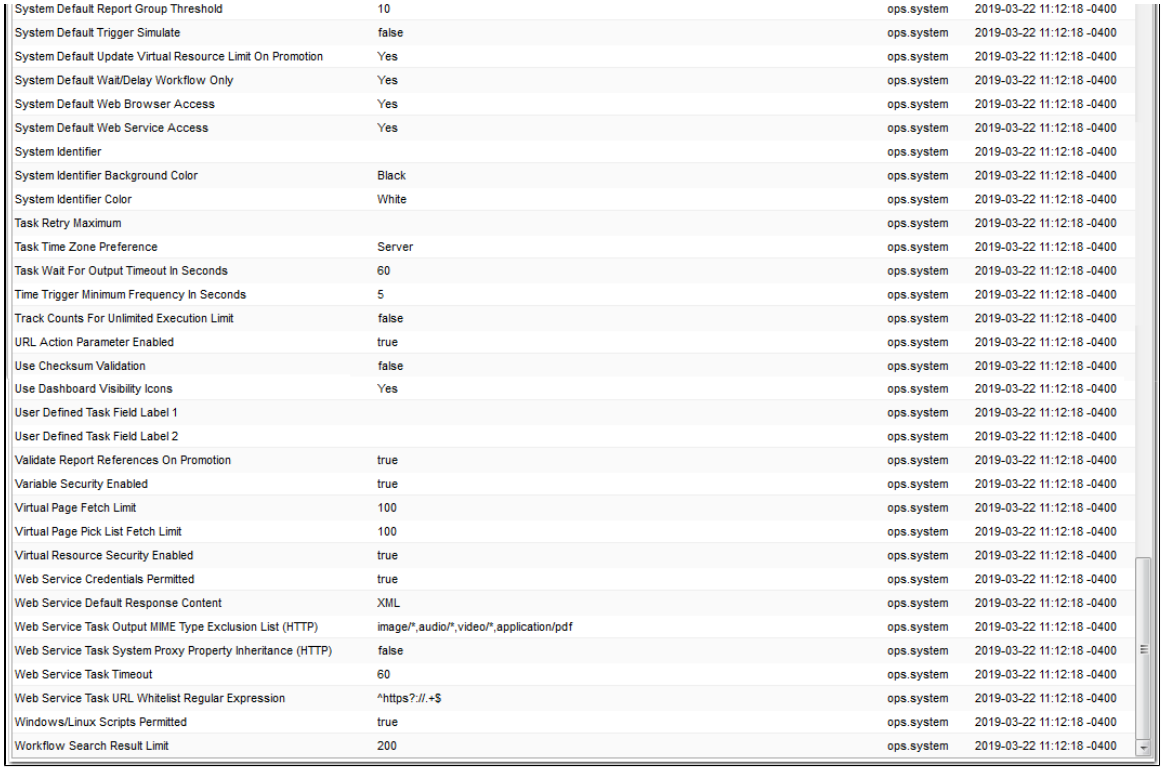


Dashboards | Properties

142 Properties

Name	Value	Updated By	Updated
Administrator Email Address		ops.system	2019-03-22 11:12:18 -0400
Agent Cache Retention Period In Days	7	ops.system	2019-03-22 11:12:18 -0400
Agent Cluster Network Alias Cache Retention In Minutes	30	ops.system	2019-03-22 11:12:18 -0400
Agent Cluster Network Alias Retry Interval In Minutes	5	ops.system	2019-03-22 11:12:18 -0400
Agent Cluster Network Alias Uquery Port	7887	ops.system	2019-03-22 11:12:18 -0400
Agent Credentials Required	false	ops.system	2019-03-22 11:12:18 -0400
Agent Heartbeat Interval In Seconds	120	ops.system	2019-03-22 11:12:18 -0400
Agent Prefix	AGNT	ops.system	2019-03-22 11:12:18 -0400
Allow In Doubt Re-run	true	ops.system	2019-03-22 11:12:18 -0400
Automatically Create Versions	true	ops.system	2019-03-22 11:12:18 -0400
Automatically Skip Conflicting Multi-Origin Paths	false	ops.system	2019-03-22 11:12:18 -0400
Banner Background Color	#186CDA	ops.system	2019-03-22 11:12:18 -0400
Banner Logo		ops.system	2019-03-22 11:12:18 -0400
Banner Logo URL		ops.system	2019-03-22 11:12:18 -0400
Broadcast On Hold If Cluster Suspended	true	ops.system	2019-03-22 11:12:18 -0400
Bulk Export Activity Permitted	false	ops.system	2019-03-22 11:12:18 -0400
Bundle Exclude On Existence Picker Default		ops.system	2019-03-22 11:12:18 -0400
Bundleless Promotion With Execute Permission Permitted	false	ops.system	2019-03-22 11:12:18 -0400
Calendar Preview Period In Years	2	ops.system	2019-03-22 11:12:18 -0400
CLI/Web Service Result Limit	1000	ops.system	2019-03-22 11:12:18 -0400
Client Export Fetch Limit	1000	ops.system	2019-03-22 11:12:18 -0400
Compress Bundle Promotion Payload	false	ops.system	2019-03-22 11:12:18 -0400
Confirm Exit	true	ops.system	2019-03-22 11:12:18 -0400
Confirm Update For Tasks In Workflows	false	ops.system	2019-03-22 11:12:18 -0400
Continue Monitoring Completed Workflows In Workflow Monitor	false	ops.system	2019-03-22 11:12:18 -0400
Copy Notes To Task Instances For Reporting	false	ops.system	2019-03-22 11:12:18 -0400
Create Version On Related List Change	true	ops.system	2019-03-22 11:12:18 -0400
Critical Path Calculations Permitted	false	ops.system	2019-03-22 11:12:18 -0400
Critical Path Color	#FF0000	ops.system	2019-03-22 11:12:18 -0400
Critical Path Dynamic Calculation Threshold In Seconds	0	ops.system	2019-03-22 11:12:18 -0400
Critical Path Monitor Polling Interval In Seconds	300	ops.system	2019-03-22 11:12:18 -0400
Critical Path Monitor Polling Threshold In Seconds	60	ops.system	2019-03-22 11:12:18 -0400
Custom Day Global Permitted	true	ops.system	2019-03-22 11:12:18 -0400
Custom Day Local Indicator Enabled	true	ops.system	2019-03-22 11:12:18 -0400
Custom Day Strict Mode	false	ops.system	2019-03-22 11:12:18 -0400
Data Backup/Purge Export Path		ops.system	2019-03-22 11:12:18 -0400
Disable Tab Indicators	false	ops.system	2019-03-22 11:12:18 -0400
Email Body Default Begin Marker	--BEGIN--	ops.system	2019-03-22 11:12:18 -0400
Email Body Default End Marker	--END--	ops.system	2019-03-22 11:12:18 -0400
Email Credentials Permitted	true	ops.system	2019-03-22 11:12:18 -0400
Email Monitor Polling Interval In Seconds	120	ops.system	2019-03-22 11:12:18 -0400
Exclude Holidays For Business Days	false	ops.system	2019-03-22 11:12:18 -0400
Export Agent References	false	ops.system	2019-03-22 11:12:18 -0400
Export Path		ops.system	2019-03-22 11:12:18 -0400
Expose Resolved Script	false	ops.system	2019-03-22 11:12:18 -0400
Expose UDM Script	false	ops.system	2019-03-22 11:12:18 -0400
Flatten Reference List Fields In Chart Reports	false	ops.system	2019-03-22 11:12:18 -0400
Forecast Period In Days	31	ops.system	2019-03-22 11:12:18 -0400
Inherit Actions On Defined For Insert Task	false	ops.system	2019-03-22 11:12:18 -0400
LDAP Synchronization Enabled	false	ops.system	2019-03-22 11:12:18 -0400
License Key		ops.system	2019-03-22 11:12:18 -0400
List Qualifying Times Format	EEEEE, MMMMMMM dd, yyyy HH:mm:ss z Z	ops.system	2019-03-22 11:12:18 -0400
Lock Account After Maximum Login Attempts	false	ops.system	2019-03-22 11:12:18 -0400

Log File Retention Period In Days	5	ops.system	2019-03-22 11:12:18 -0400
Log Level	INFO	ops.system	2019-03-22 11:12:18 -0400
Login Disclaimer		ops.system	2019-03-22 11:12:18 -0400
Maximum Login Attempts	5	ops.system	2019-03-22 11:12:18 -0400
Maximum Login Attempts Use For LDAP Authentication	true	ops.system	2019-03-22 11:12:18 -0400
Maximum Nested Variable Depth	25	ops.system	2019-03-22 11:12:18 -0400
Maximum Nested Variable Expansion	250000	ops.system	2019-03-22 11:12:18 -0400
Maximum Processing Threads	1000	ops.system	2019-03-22 11:12:18 -0400
Maximum Timer Threads	300	ops.system	2019-03-22 11:12:18 -0400
Node Time Display	Yes	ops.system	2019-03-22 11:12:18 -0400
Node Time Display Background Color	White	ops.system	2019-03-22 11:12:18 -0400
Node Time Display Color	Black	ops.system	2019-03-22 11:12:18 -0400
Node Time Display Time Zone	Server	ops.system	2019-03-22 11:12:18 -0400
OMS Log Level	INFO	ops.system	2019-03-22 11:12:18 -0400
Password Expiration Enabled	false	ops.system	2019-03-22 11:12:18 -0400
Password Expiration In Days	30	ops.system	2019-03-22 11:12:18 -0400
Perform Actions On Defined For Tasks Within Skipped Workflow	false	ops.system	2019-03-22 11:12:18 -0400
Perform Actions On Defined Workflow First	false	ops.system	2019-03-22 11:12:18 -0400
Perform Actions On Halt	true	ops.system	2019-03-22 11:12:18 -0400
Platform Log Level	WARN	ops.system	2019-03-22 11:12:18 -0400
Promotion Accept Bundle Create/Update Permission Required	false	ops.system	2019-03-22 11:12:18 -0400
Promotion History Retention Period In Days	60	ops.system	2019-03-22 11:12:18 -0400
Promotion Read Permission Required	false	ops.system	2019-03-22 11:12:18 -0400
Promotion Schedule Retention Period In Days	7	ops.system	2019-03-22 11:12:18 -0400
Promotion Strict Mode	1	ops.system	2019-03-22 11:12:18 -0400
Purge Activity By Primary Key Limit	500	ops.system	2019-03-22 11:12:18 -0400
Purge All Non-Default Users And Groups Permitted	false	ops.system	2019-03-22 11:12:18 -0400
Purge Dates From Custom Day List Older Than		ops.system	2019-03-22 11:12:18 -0400
Resolvable Credentials Permitted	false	ops.system	2019-03-22 11:12:18 -0400
Retain Overridden Step Codes On z/OS Task Re-run	false	ops.system	2019-03-22 11:12:18 -0400
Retrieve Output Default Number Of Lines	100	ops.system	2019-03-22 11:12:18 -0400
Retrieve Output Maximum Number Of Lines		ops.system	2019-03-22 11:12:18 -0400
Scheduled Report 3D Pie Chart	No	ops.system	2019-03-22 11:12:18 -0400
Scheduled Report Fetch Limit	1000	ops.system	2019-03-22 11:12:18 -0400
Scheduled Report Image Height	500	ops.system	2019-03-22 11:12:18 -0400
Scheduled Report Image Width	750	ops.system	2019-03-22 11:12:18 -0400
Scheduled Report Inline Image	Yes	ops.system	2019-03-22 11:12:18 -0400
Scheduled Report PDF Orientation	Landscape	ops.system	2019-03-22 11:12:18 -0400
Scheduled Report PDF Size	Letter	ops.system	2019-03-22 11:12:18 -0400
Show Metadata	No	ops.system	2019-03-22 11:12:18 -0400
Show Variables Fetch Global Automatically	No	ops.system	2019-03-22 11:12:18 -0400
SMTP Debug	false	ops.system	2019-03-22 11:12:18 -0400
SQL/Stored Procedure Close Additional Result Sets	true	ops.system	2019-03-22 11:12:18 -0400
SQL/Stored Procedure Ignore Update Count If No Results	false	ops.system	2019-03-22 11:12:18 -0400
SQL/Stored Procedure Maximum Rows		ops.system	2019-03-22 11:12:18 -0400
Start Server Paused	false	ops.system	2019-03-22 11:12:18 -0400
Stop Unknown Application Monitors	false	ops.system	2019-03-22 11:12:18 -0400
Strict Business Service Membership Read Constraints	false	ops.system	2019-03-22 11:12:18 -0400
Strict Connection Execute Constraints	false	ops.system	2019-03-22 11:12:18 -0400
Strict Dashboard Create Constraints	false	ops.system	2019-03-22 11:12:18 -0400
Strict Report Create Constraints	false	ops.system	2019-03-22 11:12:18 -0400
System Default Activity Quick Filters	Active=!180,!190,!200;Blocked=10,20,23,30,33,60;Completed=180,190,200; Problem=35,81,99,110,120,125,130,140;	ops.system	2019-03-22 11:12:18 -0400
System Default CLI Bulk Import Path	/opt/apache-tomcat-8.0.33/opswise_import	ops.system	2019-03-22 11:12:18 -0400
System Default Command Line Access	Yes	ops.system	2019-03-22 11:12:18 -0400
System Default Confirm Launch Command	Yes	ops.system	2019-03-22 11:12:18 -0400
System Default Confirm Task Instance Commands	No	ops.system	2019-03-22 11:12:18 -0400
System Default Maximum Versions	100	ops.system	2019-03-22 11:12:18 -0400



Step 2	Click the **License Key** property Value field and enter your encrypted license key.
Step 3	Return to the **System Details** Widget and review the License field to verify that the terms of your license are correct.
Step 4	Optionally, configure the Controller so that your system administrator receives notifications regarding license violations and expirations.

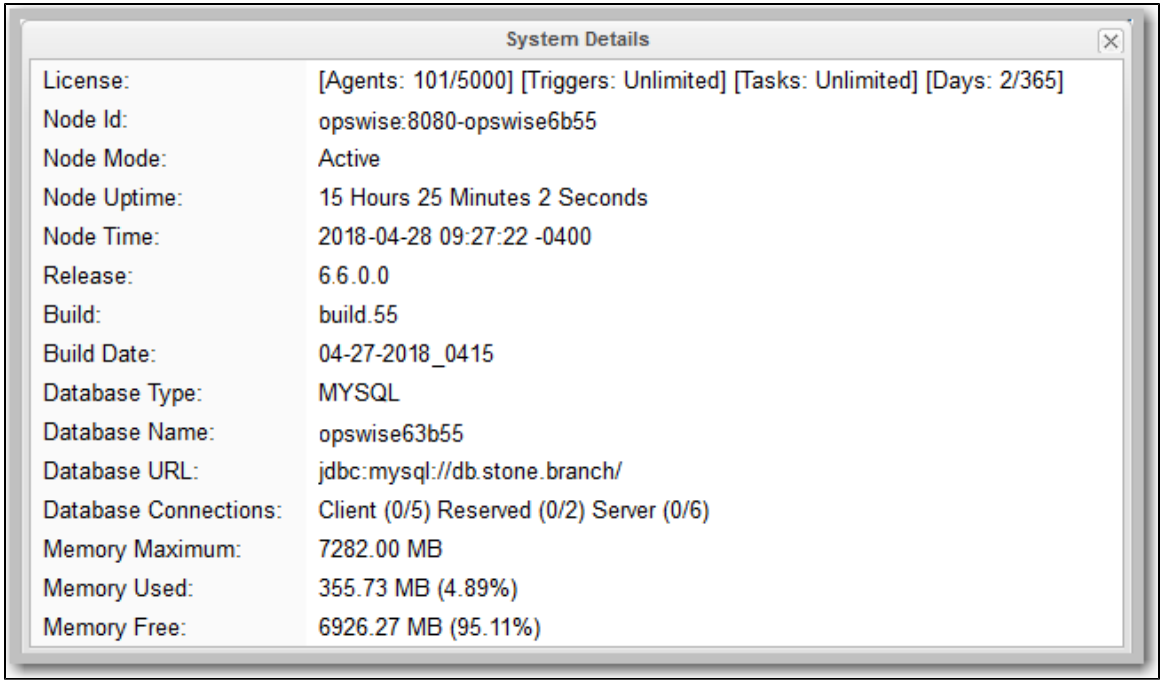
License Information

The License field in the System Details widget (view the system-defined Home Dashboard or, on the Reporting navigation pane, click **Widgets**) identifies license information for:

- Agents
- Triggers
- Tasks
- Days

The value for each field is either:

- Unlimited (unlimited number to the license)
- N/N (number remaining in license / total number in license)



Enable LDAP Synchronization

In order to log in to the Controller using LDAP credentials, you must set the LDAP Synchronization Enabled Universal Controller System property (**Administration > Configuration > Properties** in the Controller user interface) to **true**.

Configure System Notifications

System Notifications are emails sent to one or more Universal Controller system administrators based on either:

- Licensing issues (license violations, expired licenses, invalid licenses)
- Status of a system operation associated with a task instance.
- Data backup / purge operations.

Note
System Notifications are not the same as Email Notifications. Please refer to the following sections for explicitly defining Email Notifications.

- Email Notifications for Agents
- Email Notifications for OMS Servers
- Email Notifications for Cluster Nodes
- Email Notifications for Task Instance Events

In order for a system administrator to receive system notifications, you must configure the Controller for system notifications:

Step 1	Select an email connection on which the notifications will be sent and enable the Use for System Notifications field. **Note** Only one Email Connection can be used for system notifications. If this field is checked in an Email Connection Details, it will appear unchecked on all other Email Connection Details. If you then check this field in another Email Connection Details, it automatically will be unchecked from the Details in which it had been checked.
Step 2	Identify the Universal Controller Administrator(s) that will receive the system notifications by entering one or more valid email addresses for those administrators in the Administrator Email Address Universal Controller system property.
Step 3	If you want to identify the source system that is sending the system notifications in the Subject line of the emails, enter a value in the System Identifier Universal Controller system property.

System Notifications for License Violations and Expirations

When you have configured the Controller for system notification, notifications automatically are sent to the specified system administrator(s) for the following license issues:

- License violations
- Expired licenses
- Invalid licenses

License Violations

A system notification is sent for the following license violations:

- User attempts to create a task that exceeds the licensed maximum number of task definitions.
- User attempts to enable a trigger that exceeds the licensed maximum number of enabled triggers.
- Agent registration attempt exceeds the licensed maximum number of Agents.

The License field in the System Details widget (view the system-defined Home Dashboard or, on the Reporting navigation pane, click **Widgets**) identifies these maximum numbers (see License Information, above).

License Expiration

A system notification is sent at the following times if a license will expire in 7 days or sooner:

- Warning sent daily at midnight, processed same time as midnight log rollover, starting 7 days prior to license expiration.
- Warning sent on Controller start-up (or a cluster node becoming the Active cluster node) if license is within 7 days of expiring.
- Warning sent on License Key property change (if new license is still within 7 days of expiring).

A system notification is sent at the following times if a license has expired:

- Sent daily at midnight, processed same time as midnight log rollover.
- Sent on Controller start-up (or a cluster node becoming the Active cluster node).
- Sent on License Key property change (if new license still expired).

- System paused on license expiration.

> **Note**
> A License Expiration message also displays on the Universal Automation Center Console when you log in to the Controller if the license will expire within the week and when the license already has expired.

Invalid Licenses

A system notification is sent at the following times if a license is invalid:

- Sent on Controller start-up (or a cluster node becoming the Active cluster node).
- System paused on invalid license.

An invalid license will display in the Overview as [Agents: x/0] [Triggers: y/0] [Tasks: z/0] [Days: 1/0] where x, y, and z are the current number of agents, triggers, and tasks, respectively.

System Notification for System Operations

For any Controller task, you can select a system operation to be performed when any instance of that task reaches one or more specific statuses. You also can select whether or not to send system notifications based on the success and/or failure of that system operation.

For detailed information on how to set up these system notifications, see System Operation Actions.

System Notification for Data Backup / Purge Operations

For any scheduled Data Backup / Purge operation, you can select to receive system notifications.

For detailed information on how to set up system notifications for Data Backup / Purge operations, see Data Backup / Purge.

Installing Universal Bundled Controller on AIX

- Introduction
- Installation Procedure
- Uncompress the Universal Bundled Controller Distribution File
- Install the Bundled Controller
  - Silent Install
  - Interactive Install
  - Command Line Switches / Configuration File Options
  - Example
- Update the Universal Controller Start-up Properties (opswise.properties)
- Verify the Installation
- Apply the License Key
  - License Information
- Enable LDAP Synchronization
- Configure System Notifications
  - System Notifications for License Violations and Expirations
  - System Notification for System Operations
  - System Notification for Data Backup / Purge Operations

Introduction

This page tells you how to install Universal Bundled Controller, which is the Universal Controller bundled with Apache Tomcat (version 8).

> **Note**
> Currently, the Bundled Controller is available only for the AIX operating system.

It assumes you already have performed all required pre-installation procedures:

- Determined space requirements
- Installed all prerequisites.
- Downloaded the Universal Bundled Controller distribution file.

Installation Procedure

To install Universal Bundled Controller:

1	Uncompress the Downloaded Distribution File
2	Install the Bundled Controller
3	Update the Universal Controller Start-up Properties

4	Verify the Installation
5	Apply the License Key
6	Enable LDAP Synchronization
7	Configure System Notifications

Uncompress the Universal Bundled Controller Distribution File

To uncompress the Universal Bundled Controller distribution file:

```
tar -xvfo universal-controller-bundle-N.N.N.N.tar
```

Among the files contained in the tar file, please note the following:

File Name	Description
`install.sh`	Installation script
`config`	Configuration file with default values

Install the Bundled Controller

You can install the Bundled Controller silently or interactively.

Silent Install

A silent install of the Bundled Controller uses the default values contained in the Bundled Controller configuration file, **`config`**:

```
./install.sh -s
```

Interactive Install

An interactive install of the Bundled Controller prompts you for values for all command line switches:

```
./install.sh <options>
```

Command Line Switches / Configuration File Options

The following table describes the command line switches / configuration file options for the Bundled Controller installation process.

The installation process writes some of the command line switch / configuration file option values to the Universal Controller start-up properties, **`opswise.properties`**. The table identifies the properties in that file to which values are written.

> **Note**
> All command line switches are case-sensitive.

Command Line Switch	Configuration File Option	Description	Default	Controller Property
`--dbhost`	DBHOST	Database host name	localhost	n/a
`--dbname`	DBNAME	Database name	opswise	opswise.db.name=
`--dbpass`	DBPASS	Database user password	(none)	opswise.db.password=
`--dbport`	DBPORT	Database port number	3306	n/a
`--dbuser`	DBUSER	Database user name	opswise	opswise.db.user=
`--group`	OPSWISE_GROUP	User group to be used for the Controller	opscntlr	n/a
`-h`	n/a	Usage screen	(none)	n/a
`--http-port`	PORT	HTTP server port number	8080	n/a

`--install-dir`	INSTALL_DIR	Installation directory	/opt/opscntlr	n/a
`--java-home`	n/a	Path to the Java installation (JAVA_HOME)	(none)	n/a
`--rdbms`	RDBMS	Database type. Valid values are: • mysql • sqlserver • sqlserver-jtds • oracle	mysql	opswise.db.rdbms=
`-s`	n/a	Silent (unattended) install. Default is interactive install.	(none)	n/a
`--shutdown-port`	SHUTDOWN_PORT	Server shutdown port	8005	n/a
`--user`	OPSWISE_USER	System account to be used for the Controller	opscntlr	n/a

Example

Shown below is a sample command for installing the Bundled Controller (default values are used for options not specified):

```
./install.sh -s --dbuser root --dbpass userpass
```

Update the Universal Controller Start-up Properties (opswise.properties)

Follow this procedure to change two default values in the Universal Controller start-up properties file, **`opswise.properties`**, which is read by the Controller.

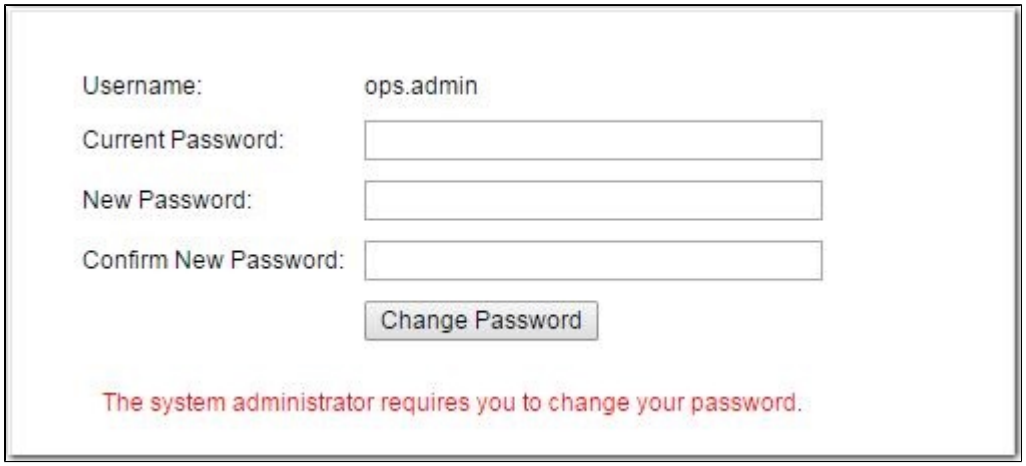
(The **`opswise.properties`** file resides in **`<tomcat directory>/conf`**).

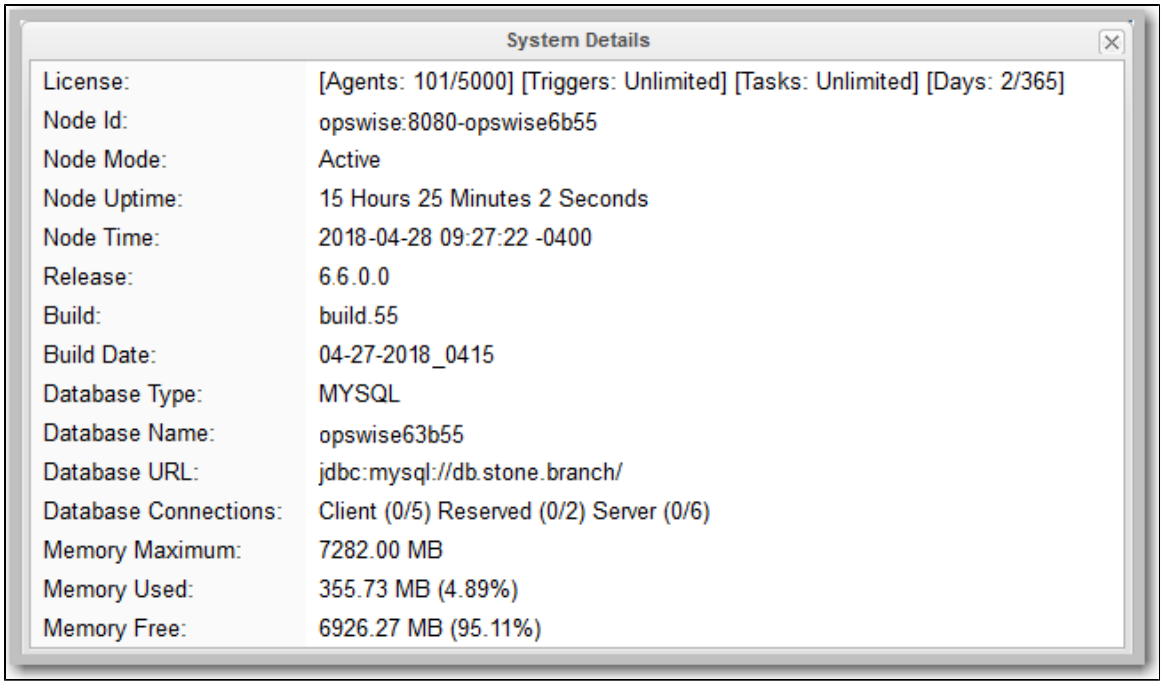
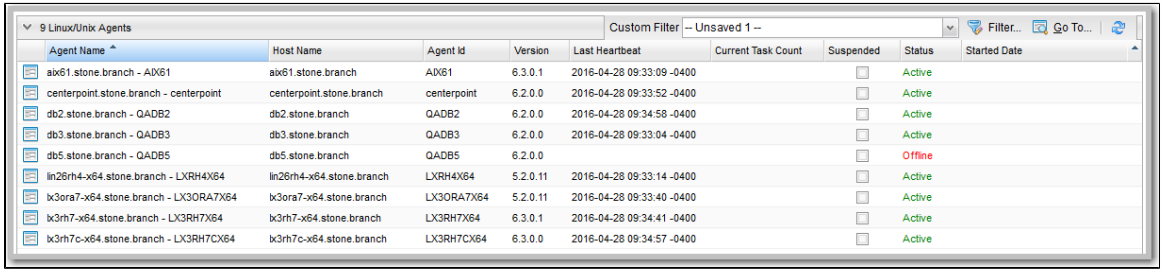
Step 1	Change the following two properties from their default value to the IBM AIX value:
	• **`opswise.trustmanager.algorithm=`** (Java trust manager algorithm)
	  • Default value = SunX509
	  • IBM AIX = IbmX509
	• **`opswise.trustmanager.provider=`** (Java trust manager provider)
	  • Default value = SunJSSE
	  • IBM AIX value = IBMJSSE2

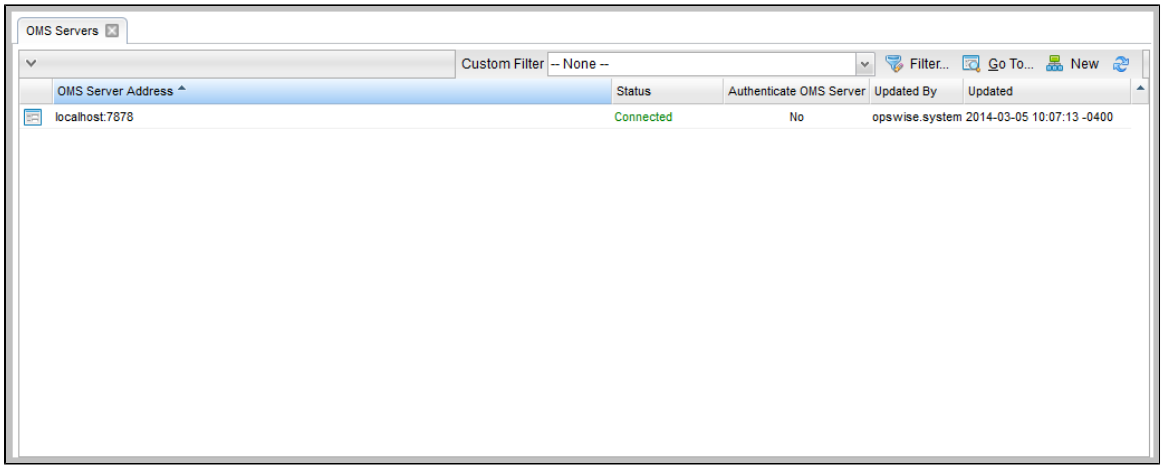
Step 2	Restart Tomcat.

Verify the Installation

To make sure the Controller is installed, running, and communication with Universal Universal Agent and Universal Message Service (OMS):

Step 1	Start the Controller.
Step 2	From your browser, access the Universal Controller user interface. `http://localhost:8080/opswise` `localhost` represents the machine name where you installed the server.
Step 3	Log in with user **`ops.admin`** and no password. A Change Password dialog displays. 

Step 4	Enter a password in the **New Password** and **Confirm New Password** fields (the **Current Password** field should remain empty) and click **Change Password**. The Universal Controller Home Dashboard displays.
Step 5	The **System Details** Widget provides current system information. Check the Release information to verify that the latest version number is displayed, as shown in the following example. 
Step 6	From the **Agents and Connections** navigation pane, select **Agents > All Agents** or **Agents > <type of Agent>**. You will see a list similar to the following example. Make sure the **Status** of the Agent is **Active**. 

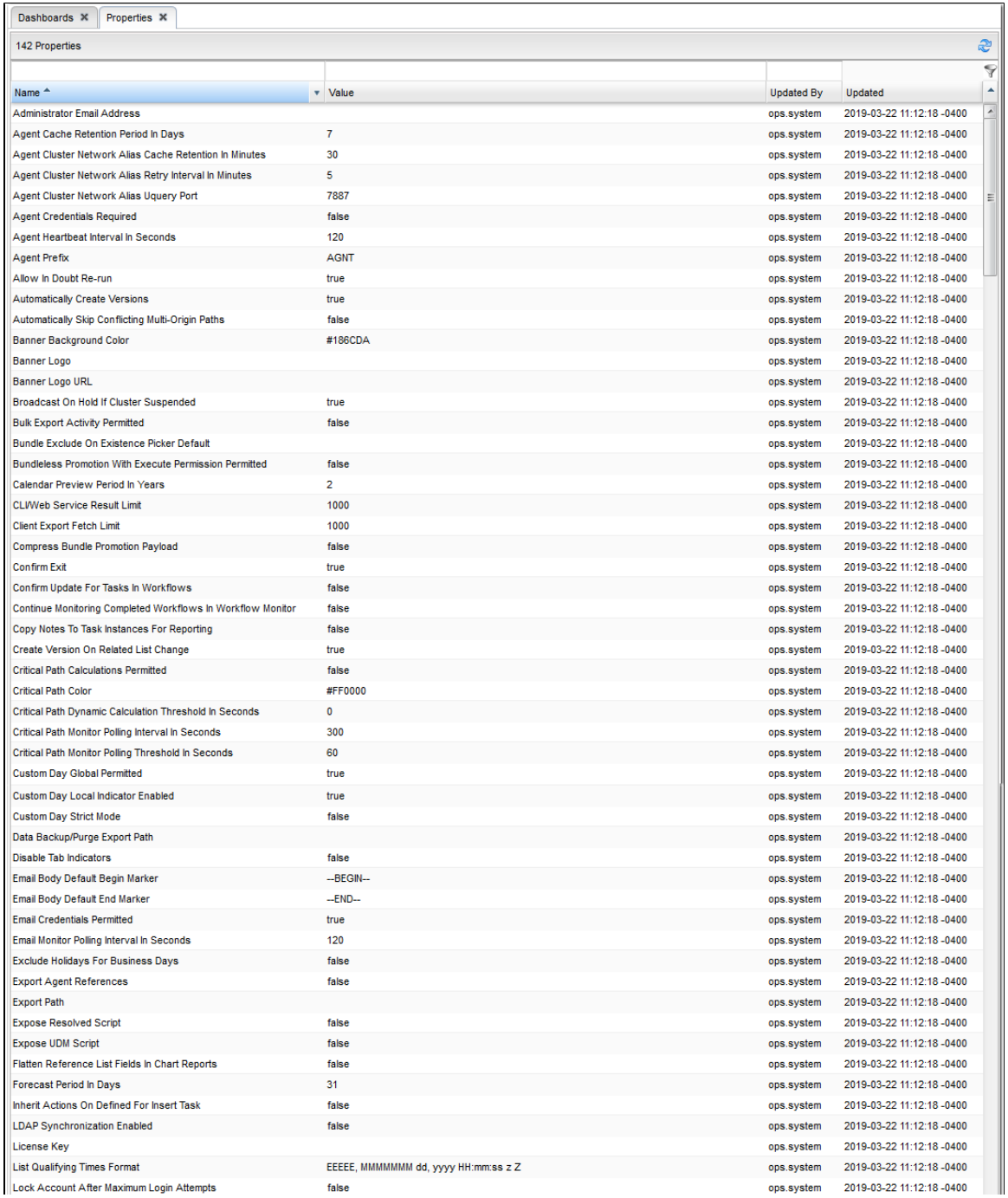
Step 7	From the **Agents and Connections** navigation pane, select **System > OMS Servers**. You will see a list similar to the following example. Make sure the **Status** of the OMS Servers are **Connected**. 
Step 8	For more information about these components in the Universal Controller user interface, see: • Agents • OMS Servers

To get started using the Controller and become familiar with its features, we recommend you spend some time going through the Tutorials.

Apply the License Key

Although you do not normally need to enter a license key immediately after installation, at some point you will need to follow these steps to enter your key:

Step 1	From the **Administration** navigation pane, select **Configuration > Properties**. The Properties list displays.

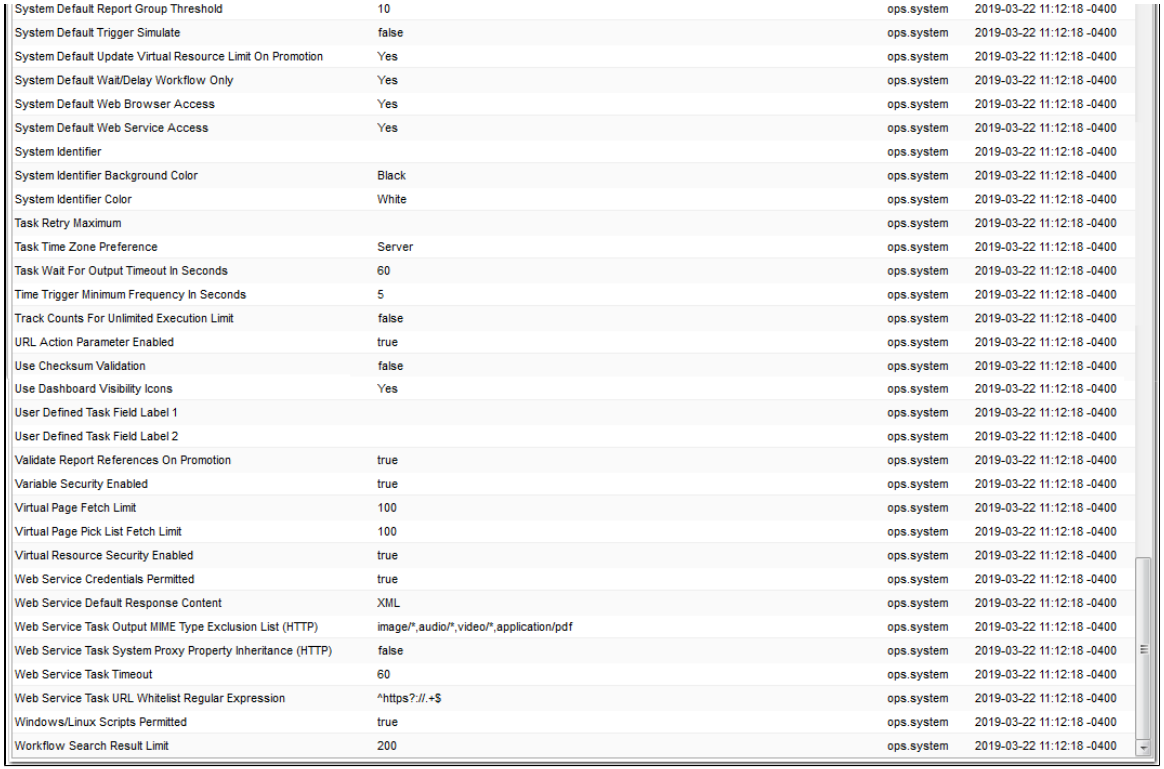


Dashboards | Properties

142 Properties

Name	Value	Updated By	Updated
Administrator Email Address		ops.system	2019-03-22 11:12:18 -0400
Agent Cache Retention Period In Days	7	ops.system	2019-03-22 11:12:18 -0400
Agent Cluster Network Alias Cache Retention In Minutes	30	ops.system	2019-03-22 11:12:18 -0400
Agent Cluster Network Alias Retry Interval In Minutes	5	ops.system	2019-03-22 11:12:18 -0400
Agent Cluster Network Alias Uquery Port	7887	ops.system	2019-03-22 11:12:18 -0400
Agent Credentials Required	false	ops.system	2019-03-22 11:12:18 -0400
Agent Heartbeat Interval In Seconds	120	ops.system	2019-03-22 11:12:18 -0400
Agent Prefix	AGNT	ops.system	2019-03-22 11:12:18 -0400
Allow In Doubt Re-run	true	ops.system	2019-03-22 11:12:18 -0400
Automatically Create Versions	true	ops.system	2019-03-22 11:12:18 -0400
Automatically Skip Conflicting Multi-Origin Paths	false	ops.system	2019-03-22 11:12:18 -0400
Banner Background Color	#186CDA	ops.system	2019-03-22 11:12:18 -0400
Banner Logo		ops.system	2019-03-22 11:12:18 -0400
Banner Logo URL		ops.system	2019-03-22 11:12:18 -0400
Broadcast On Hold If Cluster Suspended	true	ops.system	2019-03-22 11:12:18 -0400
Bulk Export Activity Permitted	false	ops.system	2019-03-22 11:12:18 -0400
Bundle Exclude On Existence Picker Default		ops.system	2019-03-22 11:12:18 -0400
Bundleless Promotion With Execute Permission Permitted	false	ops.system	2019-03-22 11:12:18 -0400
Calendar Preview Period In Years	2	ops.system	2019-03-22 11:12:18 -0400
CLI/Web Service Result Limit	1000	ops.system	2019-03-22 11:12:18 -0400
Client Export Fetch Limit	1000	ops.system	2019-03-22 11:12:18 -0400
Compress Bundle Promotion Payload	false	ops.system	2019-03-22 11:12:18 -0400
Confirm Exit	true	ops.system	2019-03-22 11:12:18 -0400
Confirm Update For Tasks In Workflows	false	ops.system	2019-03-22 11:12:18 -0400
Continue Monitoring Completed Workflows In Workflow Monitor	false	ops.system	2019-03-22 11:12:18 -0400
Copy Notes To Task Instances For Reporting	false	ops.system	2019-03-22 11:12:18 -0400
Create Version On Related List Change	true	ops.system	2019-03-22 11:12:18 -0400
Critical Path Calculations Permitted	false	ops.system	2019-03-22 11:12:18 -0400
Critical Path Color	#FF0000	ops.system	2019-03-22 11:12:18 -0400
Critical Path Dynamic Calculation Threshold In Seconds	0	ops.system	2019-03-22 11:12:18 -0400
Critical Path Monitor Polling Interval In Seconds	300	ops.system	2019-03-22 11:12:18 -0400
Critical Path Monitor Polling Threshold In Seconds	60	ops.system	2019-03-22 11:12:18 -0400
Custom Day Global Permitted	true	ops.system	2019-03-22 11:12:18 -0400
Custom Day Local Indicator Enabled	true	ops.system	2019-03-22 11:12:18 -0400
Custom Day Strict Mode	false	ops.system	2019-03-22 11:12:18 -0400
Data Backup/Purge Export Path		ops.system	2019-03-22 11:12:18 -0400
Disable Tab Indicators	false	ops.system	2019-03-22 11:12:18 -0400
Email Body Default Begin Marker	--BEGIN--	ops.system	2019-03-22 11:12:18 -0400
Email Body Default End Marker	--END--	ops.system	2019-03-22 11:12:18 -0400
Email Credentials Permitted	true	ops.system	2019-03-22 11:12:18 -0400
Email Monitor Polling Interval In Seconds	120	ops.system	2019-03-22 11:12:18 -0400
Exclude Holidays For Business Days	false	ops.system	2019-03-22 11:12:18 -0400
Export Agent References	false	ops.system	2019-03-22 11:12:18 -0400
Export Path		ops.system	2019-03-22 11:12:18 -0400
Expose Resolved Script	false	ops.system	2019-03-22 11:12:18 -0400
Expose UDM Script	false	ops.system	2019-03-22 11:12:18 -0400
Flatten Reference List Fields In Chart Reports	false	ops.system	2019-03-22 11:12:18 -0400
Forecast Period In Days	31	ops.system	2019-03-22 11:12:18 -0400
Inherit Actions On Defined For Insert Task	false	ops.system	2019-03-22 11:12:18 -0400
LDAP Synchronization Enabled	false	ops.system	2019-03-22 11:12:18 -0400
License Key		ops.system	2019-03-22 11:12:18 -0400
List Qualifying Times Format	EEEEE, MMMMMMM dd, yyyy HH:mm:ss z Z	ops.system	2019-03-22 11:12:18 -0400
Lock Account After Maximum Login Attempts	false	ops.system	2019-03-22 11:12:18 -0400

Log File Retention Period In Days	5	ops.system	2019-03-22 11:12:18 -0400
Log Level	INFO	ops.system	2019-03-22 11:12:18 -0400
Login Disclaimer		ops.system	2019-03-22 11:12:18 -0400
Maximum Login Attempts	5	ops.system	2019-03-22 11:12:18 -0400
Maximum Login Attempts Use For LDAP Authentication	true	ops.system	2019-03-22 11:12:18 -0400
Maximum Nested Variable Depth	25	ops.system	2019-03-22 11:12:18 -0400
Maximum Nested Variable Expansion	250000	ops.system	2019-03-22 11:12:18 -0400
Maximum Processing Threads	1000	ops.system	2019-03-22 11:12:18 -0400
Maximum Timer Threads	300	ops.system	2019-03-22 11:12:18 -0400
Node Time Display	Yes	ops.system	2019-03-22 11:12:18 -0400
Node Time Display Background Color	White	ops.system	2019-03-22 11:12:18 -0400
Node Time Display Color	Black	ops.system	2019-03-22 11:12:18 -0400
Node Time Display Time Zone	Server	ops.system	2019-03-22 11:12:18 -0400
OMS Log Level	INFO	ops.system	2019-03-22 11:12:18 -0400
Password Expiration Enabled	false	ops.system	2019-03-22 11:12:18 -0400
Password Expiration In Days	30	ops.system	2019-03-22 11:12:18 -0400
Perform Actions On Defined For Tasks Within Skipped Workflow	false	ops.system	2019-03-22 11:12:18 -0400
Perform Actions On Defined Workflow First	false	ops.system	2019-03-22 11:12:18 -0400
Perform Actions On Halt	true	ops.system	2019-03-22 11:12:18 -0400
Platform Log Level	WARN	ops.system	2019-03-22 11:12:18 -0400
Promotion Accept Bundle Create/Update Permission Required	false	ops.system	2019-03-22 11:12:18 -0400
Promotion History Retention Period In Days	60	ops.system	2019-03-22 11:12:18 -0400
Promotion Read Permission Required	false	ops.system	2019-03-22 11:12:18 -0400
Promotion Schedule Retention Period In Days	7	ops.system	2019-03-22 11:12:18 -0400
Promotion Strict Mode	1	ops.system	2019-03-22 11:12:18 -0400
Purge Activity By Primary Key Limit	500	ops.system	2019-03-22 11:12:18 -0400
Purge All Non-Default Users And Groups Permitted	false	ops.system	2019-03-22 11:12:18 -0400
Purge Dates From Custom Day List Older Than		ops.system	2019-03-22 11:12:18 -0400
Resolvable Credentials Permitted	false	ops.system	2019-03-22 11:12:18 -0400
Retain Overridden Step Codes On z/OS Task Re-run	false	ops.system	2019-03-22 11:12:18 -0400
Retrieve Output Default Number Of Lines	100	ops.system	2019-03-22 11:12:18 -0400
Retrieve Output Maximum Number Of Lines		ops.system	2019-03-22 11:12:18 -0400
Scheduled Report 3D Pie Chart	No	ops.system	2019-03-22 11:12:18 -0400
Scheduled Report Fetch Limit	1000	ops.system	2019-03-22 11:12:18 -0400
Scheduled Report Image Height	500	ops.system	2019-03-22 11:12:18 -0400
Scheduled Report Image Width	750	ops.system	2019-03-22 11:12:18 -0400
Scheduled Report Inline Image	Yes	ops.system	2019-03-22 11:12:18 -0400
Scheduled Report PDF Orientation	Landscape	ops.system	2019-03-22 11:12:18 -0400
Scheduled Report PDF Size	Letter	ops.system	2019-03-22 11:12:18 -0400
Show Metadata	No	ops.system	2019-03-22 11:12:18 -0400
Show Variables Fetch Global Automatically	No	ops.system	2019-03-22 11:12:18 -0400
SMTP Debug	false	ops.system	2019-03-22 11:12:18 -0400
SQL/Stored Procedure Close Additional Result Sets	true	ops.system	2019-03-22 11:12:18 -0400
SQL/Stored Procedure Ignore Update Count If No Results	false	ops.system	2019-03-22 11:12:18 -0400
SQL/Stored Procedure Maximum Rows		ops.system	2019-03-22 11:12:18 -0400
Start Server Paused	false	ops.system	2019-03-22 11:12:18 -0400
Stop Unknown Application Monitors	false	ops.system	2019-03-22 11:12:18 -0400
Strict Business Service Membership Read Constraints	false	ops.system	2019-03-22 11:12:18 -0400
Strict Connection Execute Constraints	false	ops.system	2019-03-22 11:12:18 -0400
Strict Dashboard Create Constraints	false	ops.system	2019-03-22 11:12:18 -0400
Strict Report Create Constraints	false	ops.system	2019-03-22 11:12:18 -0400
System Default Activity Quick Filters	Active=!180,!190,!200;Blocked=10,20,23,30,33,60;Completed=180,190,200; Problem=35,81,99,110,120,125,130,140;	ops.system	2019-03-22 11:12:18 -0400
System Default CLI Bulk Import Path	/opt/apache-tomcat-8.0.33/opswise_import	ops.system	2019-03-22 11:12:18 -0400
System Default Command Line Access	Yes	ops.system	2019-03-22 11:12:18 -0400
System Default Confirm Launch Command	Yes	ops.system	2019-03-22 11:12:18 -0400
System Default Confirm Task Instance Commands	No	ops.system	2019-03-22 11:12:18 -0400
System Default Maximum Versions	100	ops.system	2019-03-22 11:12:18 -0400



Step 2	Click the **License Key** property Value field and enter your encrypted license key.
Step 3	Return to the*System Details* Widget and review the License field to verify that the terms of your license are correct.
Step 4	Optionally, configure the Controller so that your system administrator receives notifications regarding license key violations and expirations.

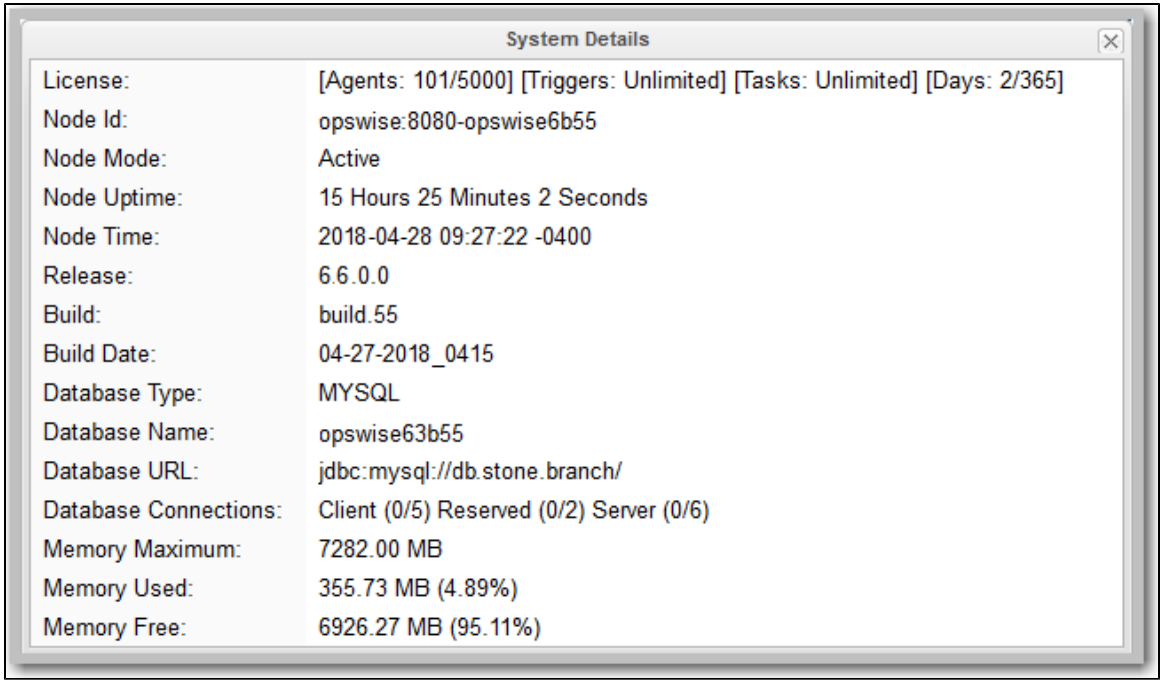
License Information

The License field in the System Details widget (view the system-defined Home Dashboard or, on the Reporting navigation pane, click **Widgets**) identifies license information for:

- Agents
- Triggers
- Tasks
- Days

The value for each field is either:

- Unlimited (unlimited number to the license)
- N/N (number remaining in license / total number in license)



Enable LDAP Synchronization

In order to log in to the Controller using LDAP credentials, you must set the LDAP Synchronization Enabled Universal Controller System property (**Administration > Configuration > Properties** in the Controller user interface) to **true**.

Configure System Notifications

System Notifications are emails sent to one or more Universal Controller system administrators based on either:

- Licensing issues (license violations, expired licenses, invalid licenses)
- Status of a system operation associated with a task instance.
- Data backup / purge operations.

Note
System Notifications are not the same as Email Notifications. Please refer to the following sections for explicitly defining Email Notifications.

- Email Notifications for Agents
- Email Notifications for OMS
- Email Notifications for Cluster Nodes
- Email Notifications for Task Instance Events

In order for a system administrator to receive system notifications, you must configure the Controller for system notifications:

Step 1	Select an email connection on which the notifications will be sent and enable the Use for System Notifications field. **Note** You can use only one Email Connection at any one time for sending system notifications.
Step 2	Identify the Controller Administrator(s) that will receive the system notifications by entering one or more valid email addresses for those administrators in the Administrator Email Address Universal Controller system property.
Step 3	If you want to identify the source system that is sending the system notifications in the Subject line of the emails, enter a value in the System Identifier Universal Controller system property.

System Notifications for License Violations and Expirations

When you have configured the Controller for system notification, notifications automatically are sent to the specified system administrator(s) for the following license issues:

- License violations
- Expired licenses
- Invalid licenses

License Violations

A system notification is sent for the following license violations:

- User attempts to create a task that exceeds the licensed maximum number of task definitions.
- User attempts to enable a trigger that exceeds the licensed maximum number of enabled triggers.
- Agent registration attempt exceeds the licensed maximum number of Agents.

The License field in the System Details widget (view the system-defined Home Dashboard or, on the Reporting navigation pane, click **Widgets**) identifies these maximum numbers (see License Information, above).

License Expiration

A system notification is sent at the following times if a license will expire in 7 days or sooner:

- Warning sent daily at midnight, processed same time as midnight log rollover, starting 7 days prior to license expiration.
- Warning sent on Controller start-up (or a cluster node becoming the Active cluster node) if license is within 7 days of expiring.
- Warning sent on License Key property change (if new license is still within 7 days of expiring).

A system notification is sent at the following times if a license has expired:

- Sent daily at midnight, processed same time as midnight log rollover.
- Sent on Controller start-up (or a cluster node becoming the Active cluster node).
- Sent on License Key property change (if new license still expired).
- System paused on license expiration.

Note
A License Expiration message also displays on the Universal Automation Center Console when you log in to the Controller if the license will expire within the week and when the license already has expired.

Invalid Licenses

A system notification is sent at the following times if a license is invalid:

- Sent on Controller start-up (or a cluster node becoming the Active cluster node).
- System paused on invalid license.

An invalid license will display in the Overview as [Agents: x/0] [Triggers: y/0] [Tasks: z/0] [Days: 1/0] where x, y, and z are the current number of agents, triggers, and tasks, respectively.

System Notification for System Operations

For any Controller task, you can select a system operation to be performed when any instance of that task reaches one or more specific statuses. You also can select whether or not to send system notifications based on the success and/or failure of that system operation.

For detailed information on how to set up these system notifications, see System Operation Actions.

System Notification for Data Backup / Purge Operations

For any scheduled Data Backup / Purge operation, you can select to receive system notifications.

For detailed information on how to set up system notifications for Data Backup / Purge operations, see Data Backup / Purge.

Adding a Cluster Node

- Overview
  - Requirements for Adding a Cluster Node
  - Procedure for Adding a Cluster Node
- Copy and Unpack the Universal Controller Distribution File
- Install the Controller
  - Command Line Switches
  - Examples
- Deploy the Controller
- Verify the Installation
- Adding an OMS Server
  - Add OMS Server to OMS Server Record
  - OMS Server Message Database

Overview

When you install Universal Controller, you create a single instance (cluster node) of the Controller. To operate Universal Automation Center in a High Availability (HA) environment, you must add one or more cluster nodes. Each cluster node should be installed on a separate machine.

This page tells you how to add one or more cluster nodes.

Requirements for Adding a Cluster Node

Each cluster node in an HA environment must connect to the same Universal Controller database. If one of the cluster nodes stops processing, another cluster node continues processing with the same data.

Each cluster node in an HA environment must be the same version and build of the Controller. To ensure this, you can either:

- Install the downloaded version of the Controller on a second machine.
- Download a new version of the Controller software, update the current version, and then install the new version on a second machine.

It is strongly recommended that an HA environment has at least two OMS Servers, although you do not need an OMS Server for every cluster node if your HA environment contains three or more cluster nodes.

Procedure for Adding a Cluster Node

This page describes the following procedure:

1	Copy and Unpack the Downloaded Distribution File
2	Install the Controller
3	Deploy the Controller
4	Verify the Installation

5	Adding an OMS Server

This procedure assumes you already have performed any required pre-installation procedure steps for the cluster node being added.

Copy and Unpack the Universal Controller Distribution File

Copy the downloaded distribution file, which was used to install the current, single instance of Universal Controller, from its current location to the machine on which you want to install a new instance of the Controller.

To unpack the Universal Controller distribution file, use the following method appropriate for your platform:

Linux/Unix	`tar xvf opswise-controller-N.N.N.N.tar`
Windows	Use an appropriate archiving / unzipping product.

Install the Controller

To install the Controller, issue the following command that is appropriate for your platform:

Linux	`> sh install-controller.sh`
Windows	`> install-controller.bat`

You must include command line switches that specify information the Controller needs to access the Tomcat installation directory, the war file, and the database. You can include additional command line switches, but they are not required.

If a required command line switch is missing from the command line, an error message will identify it during the installation process.

The Controller installation process writes the values for some command line switches to the Universal Controller start-up properties file, **`opswise.properties`** (see the table, below). For any of those command line switches that are not required and, in fact, are not included on the command line, the Controller installation process writes their default value to **`opswise.properties`**.

Command Line Switches

The following table describes the command line switches for the Controller installation process and identifies which are required.

For command line switches that have their value written to the Universal Controller start-up properties file, **`opswise.properties`**, the table also identifies the property in that file to which the value is written.

Note
All command line switches are case-sensitive.

Command Line Switch	Description	Default	Required	Controller Property
`--controller-file`	Full path of the Universal Controller war file from the downloaded Universal Controller package.	none	Yes	
`--dbname`	Universal Controller database name.	opswise	No	opswise.db.name=
`--dbpass`	Database user's password.	none	Yes	opswise.db.password=
`--dburl`	JDBC connection URL. Format: **`jdbc:<jdbc vendor>:<other jdbc vendor data>`** Examples (for MS SQLServer, **`opswise`** is the database name; for Oracle, **`XE`** is the SID): **MySQL** — **`jdbc:mysql://localhost:3306/`** **MS SQL Server** — **`jdbc:sqlserver://localhost:1433;DatabaseName=opswise`** **MS SQL Server JTDS** — **`jdbc:jtds:sqlserver://localhost:1433/opswise`** **Oracle** — **`jdbc:oracle:thin:@//localhost:1521/ServiceName`** or **`jdbc:oracle:thin:@localhost:1521:XE`**	jdbc:mysql://localhost	No	opswise.db.url=
`--dbuser`	Database user name.	none	Yes	opswise.db.user=

`--rdbms`	Database type. Valid values are: • mysql • sqlserver • oracle ***** --rdbms ***is*** required if --dburl is used in the command.	mysql	No *	glide.db.rdbms=
`--tomcat-dir`	Path to the Tomcat installation directory (contains the directories:`/bin`, `/conf`, `/logs`, `webapps`).	none	Yes	

Examples

Shown below are sample commands for installing the Controller on Linux and Windows platforms, using defaults for the database:

Linux

```
sh install-controller.sh --tomcat-dir ~/tomcat --controller-file ./opswise-controller-N.N.N.N-build.N.war --dbuser root --dbpass
userpass
```

Windows

```
install-controller.bat --tomcat-dir "c:\Program Files\Apache Software Foundation\Tomcat 7.0"
--controller-file opswise-controller-N.N.N.N-build.N.war --dbuser root --dbpass userpass
```

Note
In the Tomcat directory (--tomcat-dir), when quoting the directory is necessary due to spaces, do not use a single backslash before the ending quotation mark; use either a double backslash or no backslash to avoid the command shell from treating \" as an escape character.

Deploy the Controller

In this procedure, you will start Tomcat, which starts the Controller and builds your database tables. This process takes several minutes. When it is complete, the Controller is started and ready to use.

If Tomcat already was running when you installed the Controller, you do not need to stop and restart it; this process will occur automatically after you start the installation.

Step 1	Start Tomcat as follows:
	
	Linux
	Start the Tomcat daemon using the script placed in the **`/etc/init.d`** directory for Tomcat.
	
	`service [name of Tomcat service] start`
	
	Windows
	We recommend you use Windows Services to start Tomcat. Or, you can start Tomcat from the command line as follows:
	
	`net start [name of Tomcat service]`
	
	Linux or Windows
	You can start the service using the **`$CATALINA_HOME/bin/startup.bat`** or **`$CATALINA_HOME/bin/startup.sh`** scripts.

Step 2	You can view details of the start-up in the Tomcat window or monitor the Controller log, as described below:
	
	Linux/Unix
	Users can tail the `opswise.log` to monitor the deployment process, as follows:
	
	`tail -f $TOMCAT_DIR/opswise_logs/opswise.log`
	
	Windows
	Users can use a third-party tailing utility or open the log file using Notepad or other editor and scroll to the bottom to view the latest activity.
	
	`$TOMCAT_DIR/opswise_logs/opswise.log`

Step 3	When you see the following, the Controller is ready: • **INFO [Ops.Cluster.Monitor.0] Server is now Running in Passive mode.** • **INFO [Ops.Cluster.Monitor.0] Setting server to PASSIVE.**

Step 4	**AIX and z/Linux only**: Follow this procedure to change two default values in the Universal Controller start-up properties file, **`opswise.properties`**, which is read by the Controller.
	
	(The **`glide.properties`** file resides in **`<tomcat directory>/webapps/opswise/WEB-INF/properties`**).
	
	1. Change the following two properties from their default value to the AIX - z/Linux value:
	• **`opswise.trustmanager.algorithm=`** (Java trust manager algorithm)
	  • Default value = SunX509
	  • AIX - z/Linux value = IbmX509
	• **`opswise.trustmanager.provider=`** (Java trust manager provider)
	  • Default value = SunJSSE
	  • AIX - z/Linux value = IBMJSSE2
	2. Restart Tomcat.

You now have completed the install process and the Controller is running.

Verify the Installation

To make sure the new cluster node is installed and running properly:

Step 1	Log in to the originally installed Controller.
Step 2	Verify that the **Cluster Node Status** Widget illustrates an Active and a Passive cluster node.
Step 3	For detailed information on the new (and original) cluster nodes, select **Resources > System > Cluster Nodes**.

Note
The license key for the installed Universal Controller applies to all instances (cluster nodes) of that Controller; no additional licensing is required.

System Notifications configured for the installed Universal Controller apply to all instances (cluster nodes) of that Controller; no additional system notifications have to be configured.

Adding an OMS Server

To add a second OMS Server to an HA environment (which creates an OMS cluster), you must install Universal Agent on a machine where one of the additional cluster nodes has been added.

Add OMS Server to OMS Server Record

You must specify all members of an OMS cluster in your HA environment in the same OMS Server record.

The OMS Servers list screen will contain a single entry for all OMS cluster members defined in the record. (The OMS Servers list screen could have additional entries for an OMS Server or OMS cluster outside of your HA environment. For example, OMS Servers outside a firewall would connect to a different message database and serve different Agents, but would connect to to the same Controller.)

OMS Server Message Database

Members of an OMS cluster in an HA environment must use the same OMS Server message database.

The OMS SPOOL_DIRECTORY configuration option specifies the name of the directory where the OMS maintains its message database. For each OMS Server, you must set this option to a location shared by all of the OMS Servers in the HA environment.

Universal Controller Upgrade and Maintenance

Introduction

The procedures for upgrading Universal Controller differ from the procedures for applying maintenance to Universal Controller.

For Universal Controller 6.6.x:

- Upgrading refers to the increase of a currently installed 5.2.x version of the Controller on a machine to a 6.6.x version of the Controller (for example, upgrading Controller 5.2.0.2 to Controller 6.6.0.0).
- Applying maintenance refers to the increase of a currently installed 6.1.x or later release of the Controller on a machine to a 6.6.x release of the Controller (for example, applying maintenance to Controller 6.2.0.1 to increase it to version 6.6.0.0).

Upgrading Universal Controller from 5.2.0

- Overview
  - Upgrading vs. Applying Maintenance
  - Database Permissions
  - Supported Upgrade Paths
- Upgrade Procedures
- Make Sure No Records Are Being Processed
- Stop OMS
- Back Up Your Database
- Run an Export on the Active Controller
  - Export Scripts
  - Running the Export
- Stop Tomcat and Remove All Controllers
- Prepare Your Database
- Download the New Controller
- Install the Controller
- Verify the Active Controller Installation
- Run an Import on the Active Controller
- Check Your Data
- LDAP Synchronization
- Verify the Passive Controller Installations
- Start OMS
- Verify the Upgrade

Overview

For Universal Controller 6.6.x, upgrading refers to the increase of a currently installed 5.2.0 version of the Controller to a 6.6.x version (for example, upgrading Controller 5.2.0.5 to Controller 6.6.0.0).

You can upgrade to Universal Controller 6.6.x only from Universal Controller 5.2.0; you cannot upgrade to 6.6.x from any version earlier than 5.2.0 (for example, 5.1.1).

Note
To increase a currently installed 6.1.x or later release of the Controller to a 6.6.x release, you do not have to perform an upgrade; you only have to apply maintenance to the 6.1.x or later version.

Upgrading vs. Applying Maintenance

For Universal Controller 6.6.x, applying maintenance refers to the increase from a currently installed 6.1.x or later release of the Controller to a 6.6.x release of the Controller (for example, increase Controller 6.1.3.1 to Controller 6.6.0.0).

The procedures for upgrading differ from the procedures for applying maintenance (see Applying Maintenance to Universal Controller).

Database Permissions

In order to install or perform upgrades of Universal Controller, the database user configured for the Controller will require **DDL** (**D**ata **D**efinition **L**anguage) permission in the database during the

install or upgrade.

Once the install or upgrade has been completed successfully, the configured database user requires only **DML** (**D**ata **M**anipulation **L**anguage) permissions for running the Controller.

Supported Upgrade Paths

You can use these instructions for the supported upgrade paths shown in the following table. For any other upgrade path, consult your Stonebranch representative.

Upgrade Controller to...	1.6.0	1.7.0	5.1.0	5.2.0	6.1.x	6.2.x	6.3.x	6.4.x	6.5.x	6.6.x
From 1.5.0	✓	✓	✓	✓						
From 1.6.0		✓	✓	✓						
From 1.7.0			✓	✓						
From 5.1.0				✓						
From 5.2.0					✓	✓	✓	✓	✓	✓

Upgrade Procedures

These instructions comprise the following procedures:

1	Make Sure No Records Are Being Processed
2	Stop OMS
3	Back Up Your Database
4	Run an Export on the Active Controller
5	Stop Tomcat and Remove All Controllers
6	Prepare Your Database
7	Download the New Controller
8	Install the Controller
9	Verify the Active Controller Installation
10	Run an Import on the Active Controller
11	Check Your Data
12	LDAP Synchronization
13	Verify the Passive Controller Installations
14	Start OMS

15	Verify the Upgrade

Note
These instructions assume that you are running a High Availability Universal Controller system: a system configured with Active and Passive Controllers (cluster nodes). If you are running a single Controller, disregard the steps for Passive Controllers.

Make Sure No Records Are Being Processed

Warning
If the Controller is processing task instances when you launch an export, the results are unpredictable.

Step 1	Log in with **ops.admin** or a user with administrator privileges.
Step 2	Disable all active triggers (after making a record of each) to make sure no tasks are being processed.
Step 3	Check the Activity Monitor to verify that there are no active task instances. If there are, wait until they complete before you start the export process. If necessary, you can force finish tasks.

Stop OMS

Stop Universal Message Service (OMS).

The start/stop procedure for Universal Agent components (such as OMS) may differ depending on your platform. For instructions, see Starting and Stopping Agent Components.

Back Up Your Database

Important
Before upgrading your Controllers, back up your database. The database backup is a fail-safe measure; you will be using the Controller 5.2.0 export and Controller 6.6.x import, as described below, to migrate your data.

Run an Export on the Active Controller

In this procedure, you are performing a bulk export of data that you will import to your upgraded system in a later procedure using the bulk import.

Export Scripts

Export scripts in the Controller copy and save records to one or more XML files. The exported files then can be imported into the upgraded system.

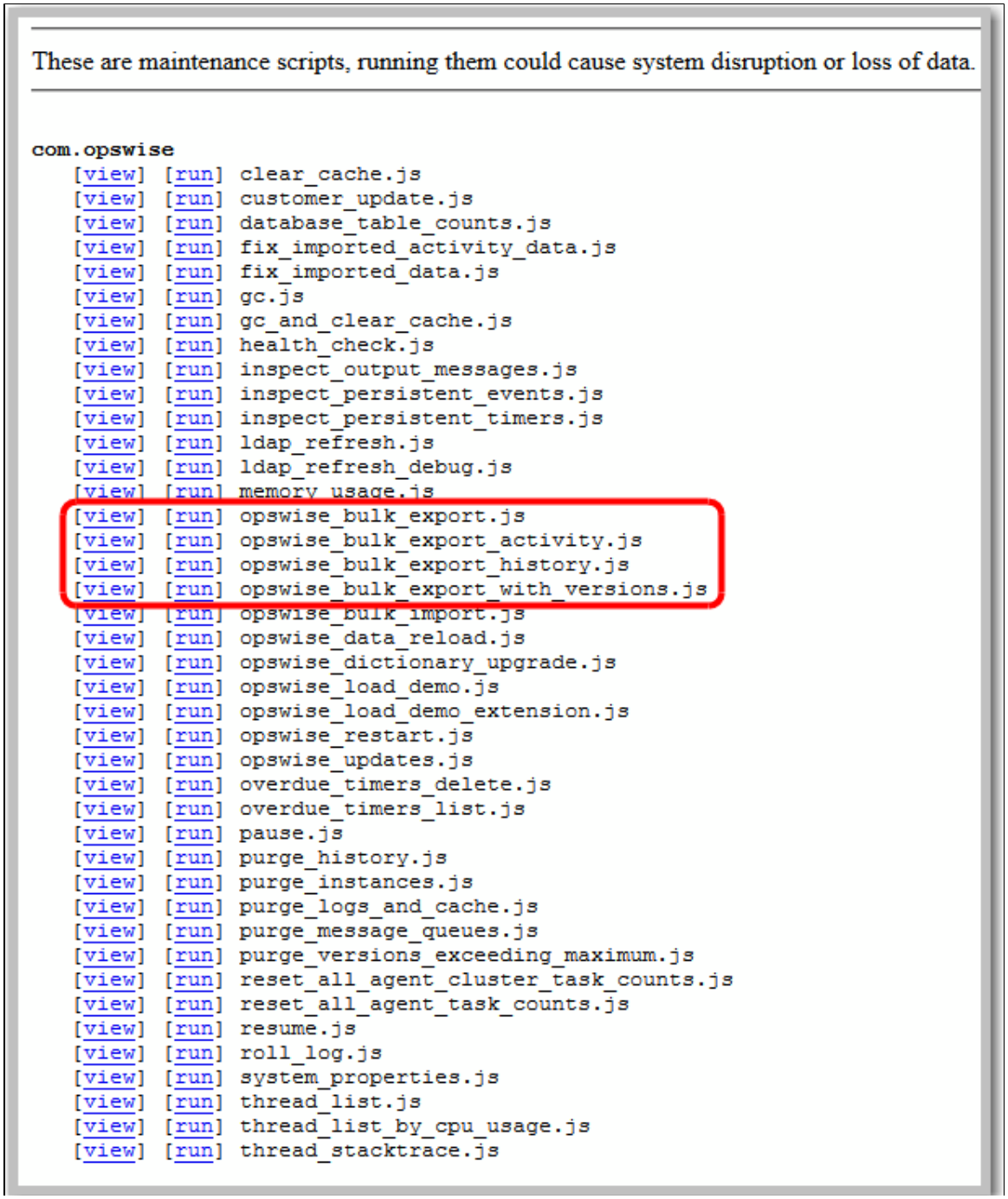
The following scripts are available for exporting different sets of records:

opswise_bulk_export.js	Exports all current record definitions, without versions.
opswise_bulk_export_with_versions.js	Exports all current record definitions and older (non-current) versions of record definitions.
opswise_bulk_export_history.js	Exports task instance history, which includes all task instances in an "end" status (cancelled, failed, skipped, finished, success).
opswise_bulk_export_activity.js	Exports all unfinished activity; that is, task instances in the Activity display. (**Not recommended for migration.**)

Running the Export

Perform the following steps to run the bulk export:

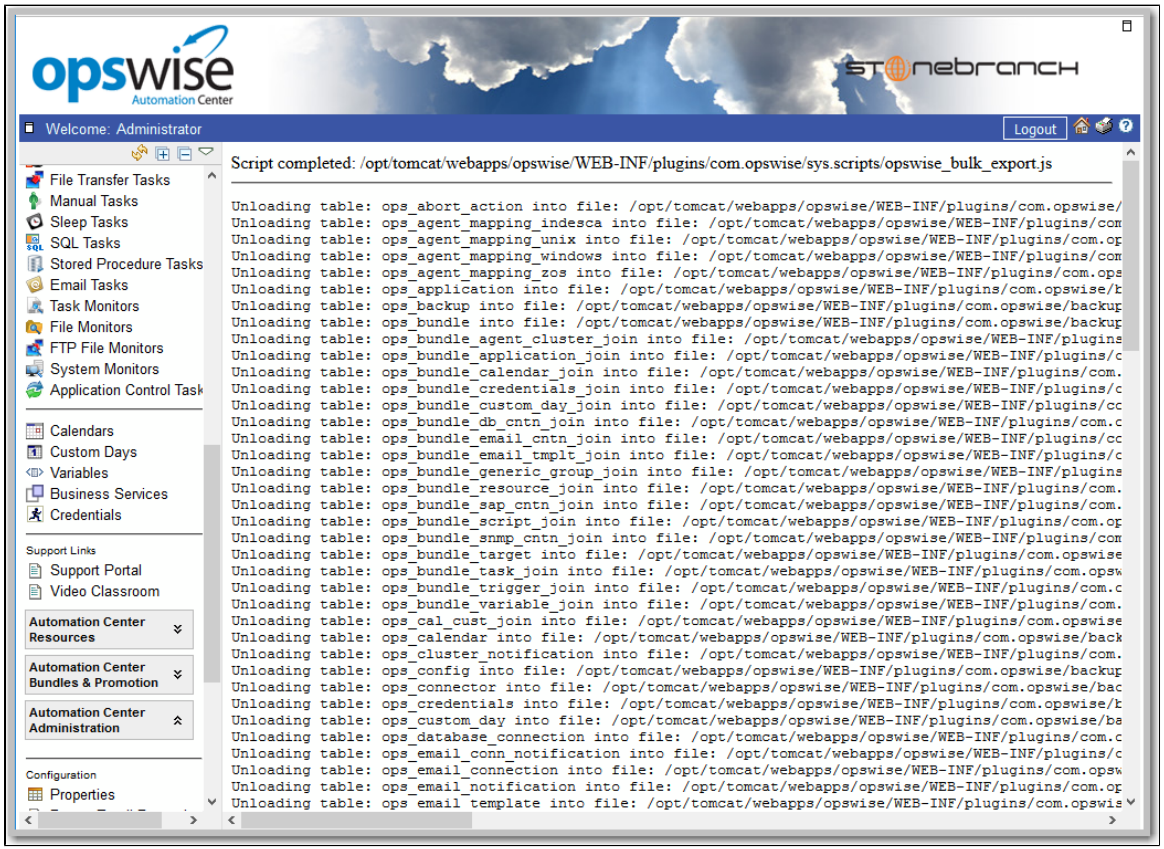
Step 1	From the navigation pane, select **Automation Center Administration > Configuration > Maintenance Scripts**. The image below shows export script options for Controller 5.2.0.



These are maintenance scripts, running them could cause system disruption or loss of data.

com.opswise

[view] [run] clear_cache.js
[view] [run] customer_update.js
[view] [run] database_table_counts.js
[view] [run] fix_imported_activity_data.js
[view] [run] fix_imported_data.js
[view] [run] gc.js
[view] [run] gc_and_clear_cache.js
[view] [run] health_check.js
[view] [run] inspect_output_messages.js
[view] [run] inspect_persistent_events.js
[view] [run] inspect_persistent_timers.js
[view] [run] ldap_refresh.js
[view] [run] ldap_refresh_debug.js
[view] [run] memory_usage.js
[view] [run] opswise_bulk_export.js
[view] [run] opswise_bulk_export_activity.js
[view] [run] opswise_bulk_export_history.js
[view] [run] opswise_bulk_export_with_versions.js
[view] [run] opswise_bulk_import.js
[view] [run] opswise_data_reload.js
[view] [run] opswise_dictionary_upgrade.js
[view] [run] opswise_load_demo.js
[view] [run] opswise_load_demo_extension.js
[view] [run] opswise_restart.js
[view] [run] opswise_updates.js
[view] [run] overdue_timers_delete.js
[view] [run] overdue_timers_list.js
[view] [run] pause.js
[view] [run] purge_history.js
[view] [run] purge_instances.js
[view] [run] purge_logs_and_cache.js
[view] [run] purge_message_queues.js
[view] [run] purge_versions_exceeding_maximum.js
[view] [run] reset_all_agent_cluster_task_counts.js
[view] [run] reset_all_agent_task_counts.js
[view] [run] resume.js
[view] [run] roll_log.js
[view] [run] system_properties.js
[view] [run] thread_list.js
[view] [run] thread_list_by_cpu_usage.js
[view] [run] thread_stacktrace.js

Step 2	Select an export script and click **Run**.
Step 3	The Controller prompts for a confirmation. Click **Yes**. As your data is exported, the output from the script is written to the screen, as shown here. 
Step 4	Check the output for error messages. If there are any, copy the output to a file and email it to Customer Support.
Step 5	Zip or tar the contents of: `[tomcat directory]/webapps/opswise/WEB-INF/plugins/com.opswise/backup/unload/`
Step 6	Copy the zip/tar file to a safe place for use after the upgrade process.

Step 7	Copy your **`glide.properties`** file to a safe place. You may need to consult this file later. The file is located here: `[tomcat directory]/webapps/opswise/WEB-INF/properties`
Step 8	Copy your license key from the Properties list and store it in a safe place.
Step 9	Copy the LDAP mapping file to a safe place for use after the upgrade process. `[tomcat directory]/webapps/opswise/WEB-INF/properties/users/ldapmap.xml` You can use this file for reference when creating LDAP mappings on the LDAP Settings page of the Controller 6.6.x user interface.

Stop Tomcat and Remove All Controllers

Important
Make sure you have copied to a safe location all of the exported files from the bulk export before continuing here, where you will stop Tomcat and remove the Controller.

Step 1	Stop the Tomcat containers in which all Passive Controllers are deployed:
	
	Windows
	Use the services application to stop Tomcat. You also can issue the stop command on a command line:
	
	`net stop [name of Tomcat service]`
	
	UNIX
	Stop the daemon using the script found in the `/etc/init.d` directory for Tomcat.
	
	`service [name of Tomcat service] stop`
	
	Windows or UNIX
	Stop the service using the **`$CATALINA_HOME\bin\shutdown.bat`** or **`$CATALINA_HOME/bin/shutdown.sh`** scripts:
	
	Windows
	
	`cd $CATALINA_HOME\bin`
	`shutdown`
	
	Linux/Unix
	
	`cd $CATALINA_HOME/bin`
	`./shutdown`

Step 2	Confirm that the Tomcat processes where the Passive Controllers are deployed are not running. **Windows** Use the Windows Task Manager. **Linux/Unix** Use the **ps** command.

Step 3	Back up the Passive Controller deployment directories in any folder other than one under the Tomcat installation. The Controller installation process renamed the unpacked **war** file (**`universal-controller-N.N.N.N-build.N.war`**) as **`opswise.war`**, so the following would be your deployment directory: `[tomcat-install]\webapps\opswise`
Step 4	Repeat steps 1 through 3 for the Active Controller.

Step 5	Delete the deployment directory and **`opswise.war`** file for all Controllers.
	
	The following would be your deployment directory and **`opswise.war`**:
	
	`[tomcat-install]\webapps\opswise`
	`[tomcat-install]\webapps\opswise.war`
	
	Note
	If you want to rename the deployment directory and ***opswise.war*** for back-up, you must do so outside of the Tomcat folder.

Prepare Your Database

Delete or drop your database using the appropriate database admin tool. You also can create a new database, using a different database name.

Important
Before dropping your existing database, make sure you have created a backup, as mentioned earlier in these procedures.

Download the New Controller

From the Stonebranch Customer Portal, download a Universal Controller package (for instructions, see Downloading Universal Controller Software).

Install the Controller

The Universal Controller is a Java application running within Apache Tomcat. For this reason, the Controller software and installation procedure is basically the same for all platforms.

If you will be running the Controller in a High Availability environment, complete the Controller installation for the targeted Active cluster node before installing the Controller for the targeted Passive node(s).

Note
If you have deployed any JDBC driver jar files (or in the case of DB2, a JDBC driver license jar file) to the `$CATALINA_HOME/webapps/opswise/WEB-INF/lib` directory, you must recopy these files to this directory and restart tomcat after your initial validation.

Verify the Active Controller Installation

Step 1	Start Tomcat where the Active Controller is deployed.
	
	When the database initialization is complete and the Controller is running, you will see the following (for example) in the log:
	
	`2012-09-12-12:53:07:339 INFO [Ops.Cluster.Monitor.0] Server is now Running in Active mode. Previous mode was Passive.`
	`2012-09-12-12:53:07:339 INFO [Ops.Cluster.Monitor.0] Setting server to ACTIVE.`

Step 2	As a precaution, clear the browser cache.
Step 3	Log in to the Active Controller with **`ops.admin`** (password is not set). On the Universal Controller Home Dashboard, verify that the Overview specifies the correct release.

Run an Import on the Active Controller

In this procedure, you are performing a bulk import of the data that you exported earlier using a bulk export.

Step 1	Unzip/untar the backup file that you created earlier using the export.
Step 2	Copy the XML files to any directory on the Controller that it has access to.
Step 3	From the Administration navigation pane, select **Configuration > Server Operations**.
Step 4	Locate and run the Bulk Import Server Operation.
Step 5	The utility prompts for a confirmation. Click **Yes**.
Step 6	As your data is imported, the output from the operation is written to the screen. Look over the output for any error messages. If you see any, copy the output to a file and email it to Customer Support.
Step 7	Due to technology and feature changes in Universal Controller 6.6.x, a number of XML files will not be imported. These include but may not be limited to: • Activity • History • Audit • Reports • Cluster nodes
Step 8	Apply your 6.6.x license key.

If you experiencing problems with the bulk import, do not continue; please contact Customer Support for guidance.

Check Your Data

At this point, your previous definitions, users and passwords have all been restored. Log out and in again, and review your records to make sure all your previous definitions, users, and passwords have been restored successfully.

LDAP Synchronization

Do not perform LDAP Synchronization until you have **successfully** bulk imported your data.

In order to log in to the Controller using LDAP credentials, you must set the LDAP Synchronization Enabled Universal Controller System property (**Administration > Configuration > Properties** in the Controller user interface) to **true**.

Verify the Passive Controller Installations

Step 1	Start Tomcat where each Passive Controller is deployed.
Step 2	Log in to the Passive Controller with **`ops.admin`** or a user with equivalent authorization. On the Universal Controller Home Dashboard, verify that the Overview specifies the correct release.

Start OMS

Do not start OMS until you have **successfully** bulk imported your data.

Start Universal Message Service (OMS).

The start/stop procedure for Universal Agent components (such as OMS) may differ depending on your platform. For instructions, see Starting and Stopping Agent Components.

Verify the Upgrade

Verify that the Controller is installed and running properly (see Verifying a Controller Installation).

Verify that your Agent components are communicating with the Active Controller (see Verifying Universal Agent Installation).

Applying Maintenance to Universal Controller

- Overview
  - Applying Maintenance vs. Upgrading
- Universal Controller Maintenance
- Verify the Installation

Overview

For Universal Controller 6.6.x, applying maintenance refers to the increase from a currently installed 6.1.x or later release of the Controller to a 6.6.x release of the Controller (for example, increase Controller 6.2.0.1 to Controller 6.6.0.0).

If you want to increase Controller 5.2.0 to Controller 6.6.x, you must perform an upgrade. The procedures for upgrading differ from the procedures for applying maintenance (see Upgrading Universal Controller from 5.2.0).

Applying Maintenance vs. Upgrading

For Universal Controller 6.6.x, upgrading refers to the increase of its currently installed 5.2.0 version to a 6.6.x version (for example, upgrading Controller 5.2.0.5 to Controller 6.6.0.0).

You cannot upgrade to Controller 6.6.x from versions prior to 5.2.0 (for example, 5.1.1).

The procedures for upgrading differ from the procedures for applying maintenance (see Upgrading Universal Controller from 5.2.0).

Universal Controller Maintenance

As a precautionary measure, it is highly recommended that you back up the Universal Controller database prior to applying maintenance.

Note
These instructions assume that you are running a High Availability Universal Controller system: a system configured with ***Active*** and ***Passive*** Controllers (cluster nodes). If you are running a single Controller, disregard the steps for the ***Passive*** Controllers.

To apply maintenance to the currently installed release of Universal Controller:

Step 1	From the Stonebranch Customer Portal, download the Universal Controller 6.6.x package (for instructions, see Downloading Universal Controller Software).

Step 2 Unpack the Universal Controller distribution file, using the following method appropriate for your platform:

Windows
Use an appropriate archiving / unzipping product.

Linux/Unix

```
tar -xvf universal-controller-N.N.N.N.tar
```

Step 3 Stop the Tomcat container in which the ***Passive*** cluster node is deployed.

Windows
Use the services application to stop Tomcat. You also can issue the stop command on a command line:

```
net stop [name of Tomcat service]
```

UNIX
Stop the daemon using the script found in the `/etc/init.d` directory for Tomcat.

```
service [name of Tomcat service] stop
```

Windows or UNIX
Stop the service using the **`$CATALINA_HOME/bin/shutdown.bat`** or **`$CATALINA_HOME/bin/shutdown.sh`** scripts:

- **Windows**

```
cd $CATALINA_HOME\bin
shutdown
```

- **Linux/Unix**

```
cd $CATALINA_HOME/bin
./shutdown
```

Step 4 Stop the Tomcat container in which the ***Active*** cluster node is deployed, using one of the methods shown in Step 3.

Step 5 For the ***Active*** cluster node deployment:

1. Delete the existing **deployment directory** and **war** file from your **webapps** directory.

   The Controller installation process renamed the unpacked **war** file (**`universal-controller-N.N.N.N-build.N.war`**) as **`opswise.war`**, so the following would be your **deployment directory** and **war** file:

   ```
   [tomcat-install]\webapps\opswise
   [tomcat-install]\webapps\opswise.war
   ```

   Note
   If you want to rename the **deployment directory** and ***opswise.war*** for back-up, you must do so outside of the Tomcat folder.

2. Copy the **war** file from the new downloaded package to your **webapps** directory and rename the **war** file **`opswise.war`**.
3. Start the Tomcat container in which the ***Active*** cluster node is deployed.

   Note
   We recommend that all Universal Controller users clear their browser cache and close their browser prior to re-opening and navigating back to the Universal Controller URL to ensure that the most recent client updates are loaded.

4. Log in to the ***Active*** cluster node deployment with user **ops.admin** or a user with equivalent authorization and verify the installation (see **Verify the Installation**, below).\

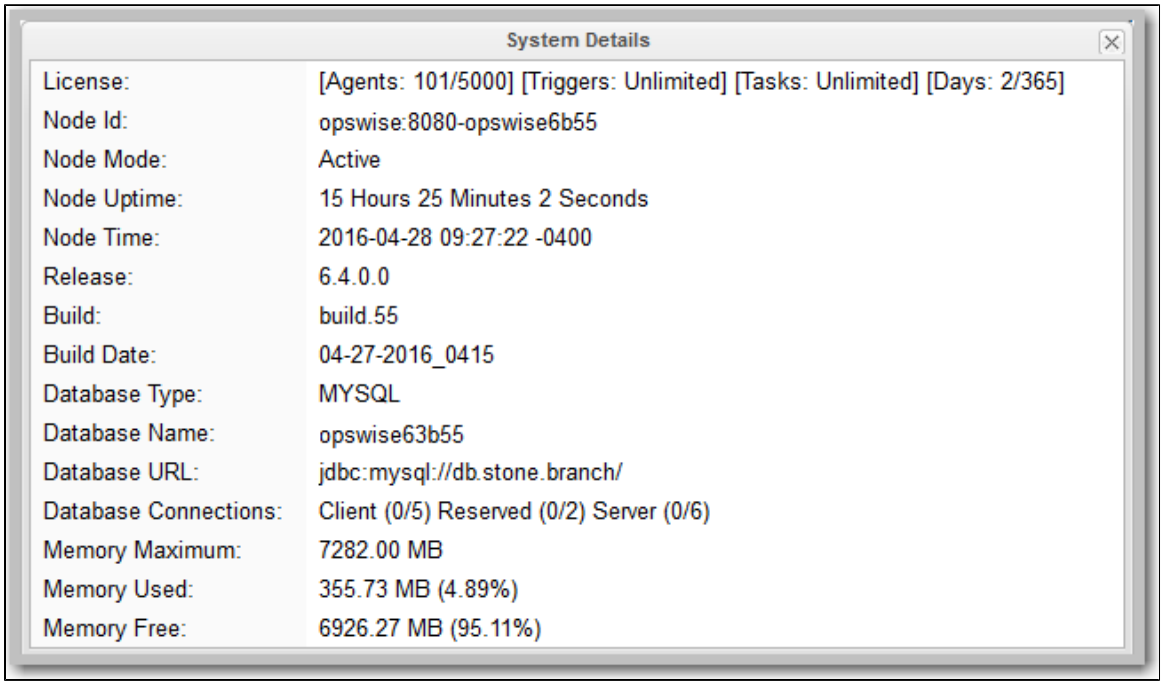
   Note
   If you have deployed any JDBC driver jar files (or in the case of DB2, a JDBC driver license jar file) to the `$CATALINA_HOME/webapps/opswise/WEB-INF/lib` directory, you must recopy these files to this directory and restart Tomcat after your initial validation.

Step 6 Repeat Step 5 for the ***Passive*** cluster node deployment.

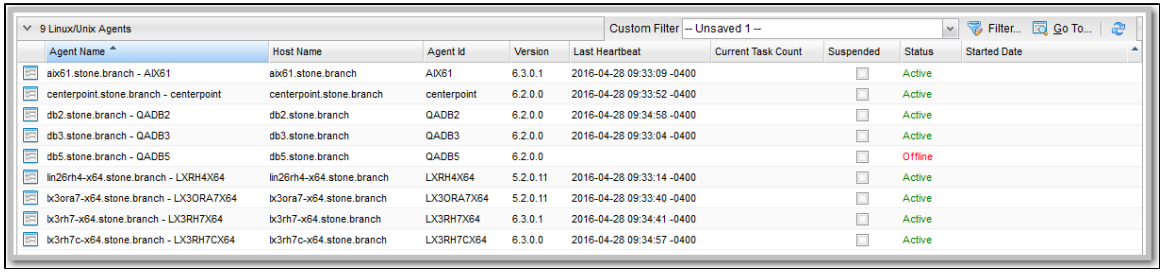
Verify the Installation

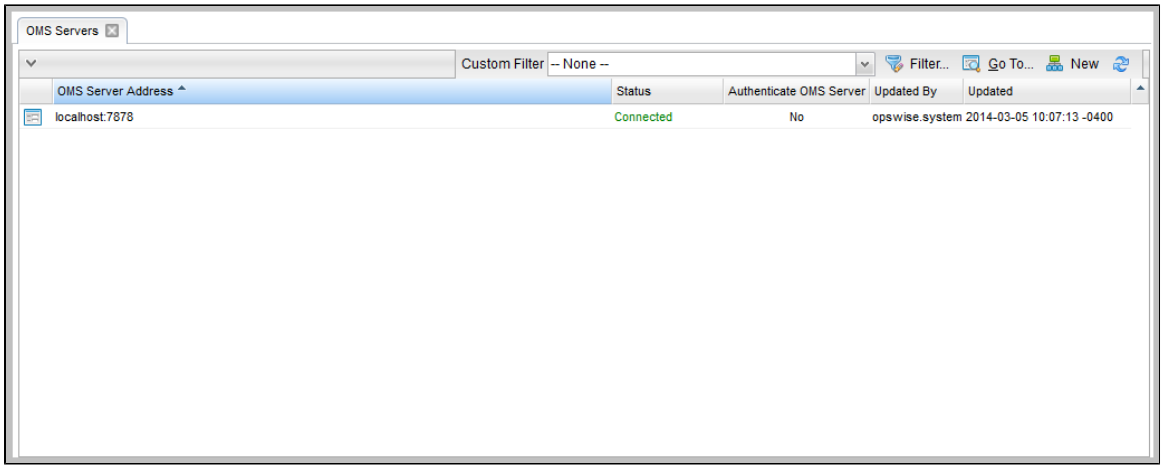
To make sure the Controller is installed, running, and communication with Universal Agent and Universal Message Service (OMS), verify the installation after you have logged on:

Step 1 From the Home dashboard, verify that the System Details widget displays the appropriate Universal Controller release.



Step 2 From the **Agents and Connections** navigation pane, select **Agents > All Agents** or **Agents > <type of Agent>**. You will see a list similar to the following example. Make sure the **Status** of the Agent is **Active**.



Step 3	From the **Agents and Connections** navigation pane, select **System > OMS Servers**. You will see a list similar to the following example. Make sure the **Status** of the OMS Servers are **Connected**. 
Step 4	For more information about these components in the Universal Controller user interface, see: • Agents • OMS Servers

Starting and Stopping Universal Controller

These pages provide platform-specific instructions for starting and stopping Universal Controller 6.6.x:

- Starting and Stopping Universal Controller - UNIX and Windows
- Starting and Stopping Universal Bundled Controller on AIX

Starting and Stopping Universal Controller - UNIX and Windows

- Starting and Stopping the Controller on UNIX
- Starting and Stopping the Controller on Windows

Starting and Stopping the Controller on UNIX

Note
These procedures are appropriate for all supported systems of UNIX:

Linux	To start or stop the Controller (all versions), issue the following commands:
	
	`$CATALINA_HOME/bin/startup.sh`
	`$CATALINA_HOME/bin/shutdown.sh`
	
	or
	
	`service tomcat start`
	`service tomcat stop`
	
	If you have configured your system with **init.d**, you also can use the following commands:
	
	`/etc/init.d/tomcat start`
	`/etc/init.d/tomcat stop`

AIX	The procedures for starting and stopping the Controller are dependent on how Tomcat was configured when the Controller installed.

Starting and Stopping the Controller on Windows

To start or stop the Controller (all versions) from the DOS prompt, use the following commands:

```
net stop $Tomcat_Service_Name
net start $Tomcat_Service_Name
```

Note
`$Tomcat_Service_Name` may vary based on the version of Tomcat installed on your machine.

Starting and Stopping Universal Bundled Controller on AIX

Starting the Universal Bundled Controller

To start the Universal Bundled Controller, execute the following script:

```
/etc/rc.d/rc2.d/Sopswise start
```

Stopping the Universal Bundled Controller

To stop the Universal Bundled Controller, execute the following script:

```
/etc/rc.d/rc2.d/Kopswise stop
```