

Best Practices for Stopping and Starting AutomationEngine Processes

The intent of this document is to show the best way to start and stop your UC4 system under normal circumstances.

The Differences Between UC4 System Shutdown and Machine/Server Shutdown

Shutting down your UC4 system is different than simply shutting down (or 'bouncing') the machine on which the AutomationEngine resides. In this case, the significant portions of the AutomationEngine are server processes, which are broken down into two types: the Communication Processes (CPs) and Worker Processes (WPs). While the CPs and WPs are started and running on a physical or virtual machine somewhere in your environment, the information that they use to make connections and run jobs is stored in the UC4 database.

If you stop a Windows machine and restart it, all of the information cached in the RAM is cleared out. While some settings will remain, all of the programs that were running no longer have any hold on the machine's resources (RAM and CPU) and will start fresh when you double-click the icons. This is why a restart is popular to fix many programmatic failures—memory leaks can be common in programs, and restarting a desktop machine is a quick way to release the hold on resources.

If your UC4 system is having performance problems, stopping and starting the machine in the same way is generally not an effective way to handle them. First of all, memory leaks are rare with the AutomationEngine. Secondly, because the connection information and working messages are stored in the UC4 database, simply killing the process does nothing (except free up local memory and processing, briefly). When you restart the WP processes (for example), it simply continues on with the messages that are stored in the database. If the database hasn't changed, no change has been made to the performance.

Also, since the AutomationEngine is almost always in a multi-server environment, a complete restart will probably include CPs and WPs on two or more machines, a database restart, and a restart of all of the individual agent machines.

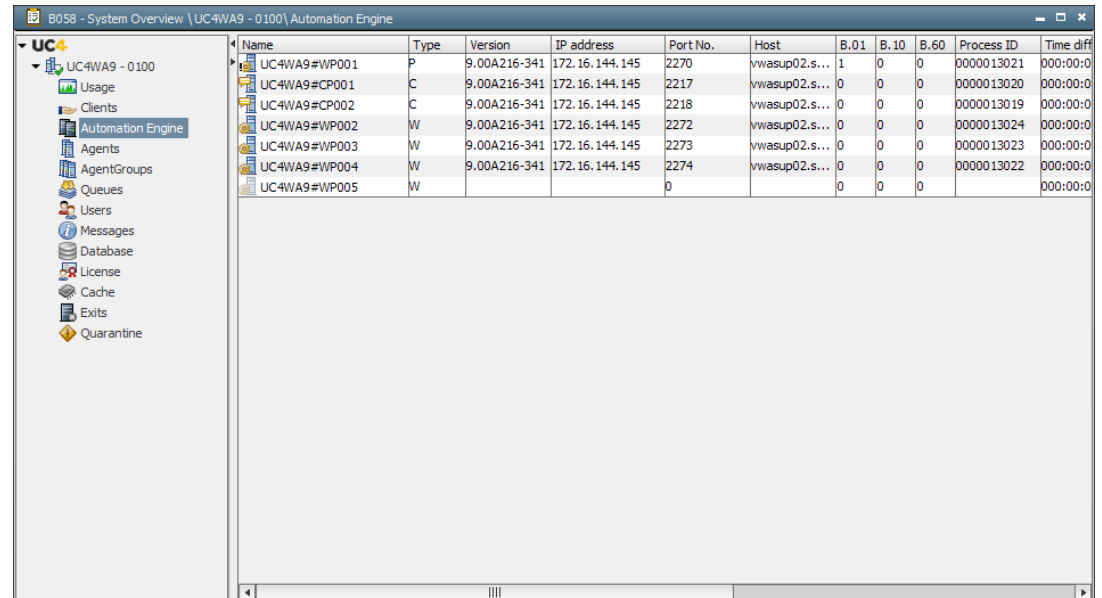
Preparing for an AutomationEngine Shutdown

When preparing for an AutomationEngine shutdown, you will need to gather the complete system information, in order to know exactly what needs to be shut down. This may seem obvious, but since an enterprise-level AutomationEngine environment can feature three or four machines running Server processes, a large database, hundreds of UserInterfaces, ServiceManagers, etc., proper information and organization is essential.

Find out how many CPs and WPs are running on your system. This can be accomplished in two basic ways: the System Overview, and from a single WP or CP log file.

1. Log into the UserInterface
2. In the second row down, click on the second button from the left titled "System Overview." This will bring up a table of all the UC4 system information
3. Select 'Automation Engine' on the left-hand pane

The information in this table should show something like this:



The screenshot shows the UC4 System Overview window with the Automation Engine table selected. The table lists various UC4 processes and their status.

Name	Type	Version	IP address	Port No.	Host	B.01	B.10	B.60	Process ID	Time diff
UC4WA9#WP001	P	9.00A216-341	172.16.144.145	2270	vwasup02.s...	1	0	0	0000013021	000:00:0
UC4WA9#CP001	C	9.00A216-341	172.16.144.145	2217	vwasup02.s...	0	0	0	0000013020	000:00:0
UC4WA9#CP002	C	9.00A216-341	172.16.144.145	2218	vwasup02.s...	0	0	0	0000013019	000:00:0
UC4WA9#WP002	W	9.00A216-341	172.16.144.145	2272	vwasup02.s...	0	0	0	0000013024	000:00:0
UC4WA9#WP003	W	9.00A216-341	172.16.144.145	2273	vwasup02.s...	0	0	0	0000013023	000:00:0
UC4WA9#WP004	W	9.00A216-341	172.16.144.145	2274	vwasup02.s...	0	0	0	0000013022	000:00:0
UC4WA9#WP005	W			0		0	0	0		000:00:0

A similar table can be found in the WP log files, near the initialization information.

1. Go to the <UC4 installation folder>\automationengine\temp directory.
2. View the most recent WP log file, usually labeled WPsrv_log_001_00.txt.
3. Scroll down until you see a table that looks like the following:

20120724/155243.377 -	Server	Typ	C	Host	Port	StartTime	LastUpdateTime
20120724/155243.377 -	UC4WA9#WP001	FWP	0	172.16.144.145	2270	2012-07-13 15:09:21	2012-07-24 22:50:12
20120724/155243.377 -	UC4WA9#WP002	WP	0	172.16.144.145	2272	2012-07-13 15:10:21	2012-07-24 22:50:14
20120724/155243.377 -	UC4WA9#CP001	CP	0	172.16.144.145	2217	2012-07-24 22:52:37	2012-07-24 22:52:37
20120724/155243.377 -	UC4WA9#WP003	WP	0	172.16.144.145	2273	2012-07-13 15:10:21	2012-07-24 22:50:16
20120724/155243.377 -	UC4WA9#CP002	CP	0	172.16.144.145	2218	2012-07-24 22:52:37	2012-07-24 22:52:37

We will analyze the System Overview table for this example.

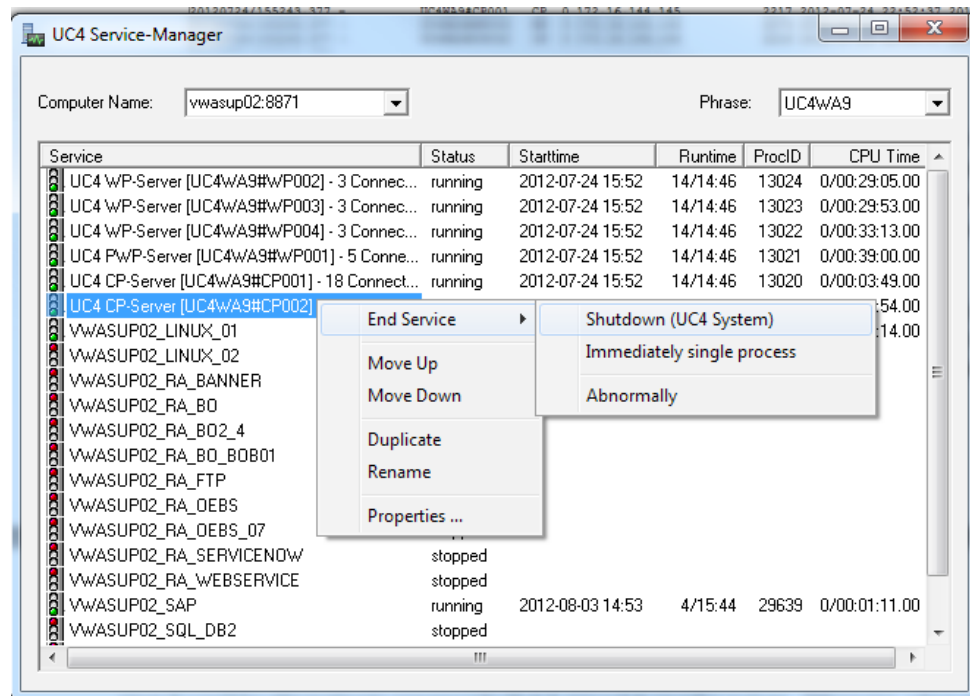
This table shows four different WPs (WP001, WP002, WP003, and WP004), and two different CPs (CP001 and CP002) running on this system. WP005 exists, but isn't currently running. It is important to note the IP address and host of these WP and CP processes. This will tell you where these processes reside. In order to shut down a full UC4 AutomationEngine, all CPs and WPs that are shown here must be stopped. Shutting down WPs and CPs on a single host is not enough.

Stopping Clients & Queues

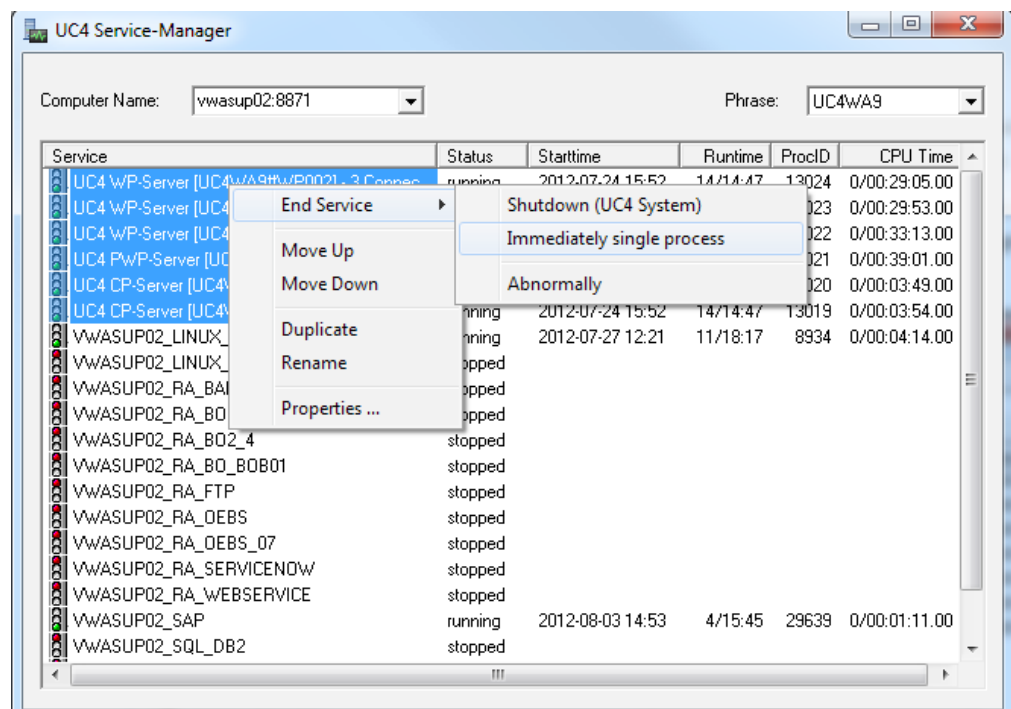
With a planned outage, you could also stop the clients and queues, which will prevent additional jobs from kicking off once the system is restarted allowing the administrator to control the starting of all jobs once the system is confirmed up and running. This may help a UC4 system to come up more quickly since it won't be attempting to process jobs that it missed during the outage. Otherwise, when a UC4 system comes up, as soon as the first WP and CPs are started, the work is continued immediately.

Preparing the Kill Commands

At this time you will want to prepare your commands for stopping the CP and WP processes. This is simple enough if you are using the UC4 Service Manager since you can open up the Service Manager Dialog, right-click a single CP or WP and select End Service Shutdown (UC4 System).



It is also possible to multi-select processes and choose “Immediately single process” like this:



From a UNIX system, you can simply use a 'ps -ef | grep uc*' to find the running processes and run a 'kill -9' command on the specific processes 'ucsrvc' and 'ucsrwv'.

Execution of Kill Commands

If you choose to kill the UC4 CPs and WPs individually (either via the command line or the Service Manager, always kill the Primary WP process last.

WP processes are of three different types: Primary, Dialog and Normal. The Primary WP (PWP) is a special type of which there can be only one. If the PWP goes down, the system will automatically attempt to make another WP the PWP. This can cause the system to delay in shutting down and cause conflicts in the Message Queues. If you kill the PWP last, this will ensure that the no other WP is made the PWP and the system will shut down more efficiently.

Once you have executed your kill commands on all machines running WPs and CPs, you should confirm that all WP and CP processes are stopped and that the UC4 system confirms they are stopped. First, check the Operating System (OS) for any processes that start with 'uc-srv.' If you find none running, you can check one of the Message Queue (MQ) tables to confirm that the UC4 database has no records of connected server processes.

MQ tables are special workspace tables in the UC4 database. On a new UC4 system (on which nothing has been started and no jobs have been run) all of these tables should be empty. The MQSRV table should not contain any server processes when the UC4 system is shut down. So, if you run this simple select statement against the UC4 database:

```
SELECT * FROM MQSRV
```

and you return results that contain CPs or WPs, you either have processes running somewhere in your environment, or these are orphaned records of old server processes. You can confirm the latter by looking at the IP address returned from this query and checking the related machine for running processes.

Potential Problems

If the UC4 system was on a machine or machines that crashed, there may be orphaned records in the MQ tables. As was stated previously, the MQ tables are a UC4 workspace containing job and running system information. Some of this information is persistent while the system is running, other information may remain only for a fraction of a second while jobs are being reported and executed. When a machine crashes, it is possible that information in the MQ tables will be orphaned and this could cause the system to not start correctly. This can be corrected with a COLD restart which will be discussed later.

Jobs in the Activities Window that are currently running or scheduled to run when a system comes down

Since the UC4 system can be a complex connection of many applications connected to hundreds or thousands of agents running 24/7 across the globe a customer may not be able to stop all jobs and processes for a system outage. In this case (or if a system crashes unexpectedly) it is important to know how jobs will run or complete.

Since agents are remotely installed they are mostly unaffected by the UC4 Automation Engine shutdown. Any jobs that are currently running will continue to run as long as the agent and machine the agent is installed on continues to run. The only impact will be that if the CPs and

WPs have not returned when the job completes, the agent will not be able to report the completed status to the UC4 system. So, when the system does return fully, the status of the job will be 'ENDED_LOST.' This simply means: Completed, but no information.

Any jobs that are scheduled to run while the system is down will not be kicked off until the UC4 system returns. Once the CPs and WPs are started, and any related Clients and Queues are restarted the jobs will run as previously scheduled (unless they have a start time set that has passed, of course.)

Starting the UC4 System

There are two types of start procedures for the UC4 system a NORMAL start and a COLD start. The difference is that a COLD start will clear the MQ tables of all entries, and a NORMAL start will not. The benefit of a NORMAL start is that the UC4 system will come up more quickly. A COLD start will refresh all information and insure that connections are fresh and relevant. A COLD restart is most used when agents aren't connecting right, or after an unexpected shutdown.

For a NORMAL start, simply use the relevant start commands for your OS or the Service Manager Dialog to start the CP & WP processes. For Windows you can double-click the executables ucsrvcp.exe and ucsrvwp.exe. This can be repeated to start as many CPs and WPs as needed.

For a COLD start, the specific instructions are well-documented on the UC4 Knowledge Base under article KB0010116.

In order to confirm that a COLD start was effective you will need to access check the first WP log file before other WPs are started. Previously, this paper mentioned the table that shows WP and CP process connections in the WP log file. Open the most recent log file and find this table. If a COLD start was effective in clearing all of the connection information you will see only a single entry (for the WP that is currently running.) If there is more than one entry, connection information has remained and you should contact UC4 Support for further instructions at 877-277-9679 or support@uc4.com .

The COLD start can also be confirmed by checking the MQ tables for entries. In particular, the MQSRV table should have no entries except for the single WP after a COLD start has been activated. The statement will be:

```
SELECT * FROM MQSRV
```

Since your UC4 system is now running, you will need to confirm that the Clients are set to "go" and the Queues are activated. If a Queue won't start, it could be that a TimeZone object is not attached to the Queue.