



IBM Software Group

# Agent Management Services

*Presentation for AVP Customers*

**Tivoli** software

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**ON DEMAND BUSINESS™**

# Agenda

- Strategy
- Architecture
- Features



# What is Agent Management Services?

- A new approach to common agent lifecycle management
  - ▶ Emphasizes consistent Visualization, Control, and Automation of agents by consuming their *existing* start, stop, and health check interfaces in a technology independent manner.
  - ▶ De-emphasizes requiring a common runtime (technology dependent) for all agents in order to achieve consistent VCA



## What are the benefits of the new approach?

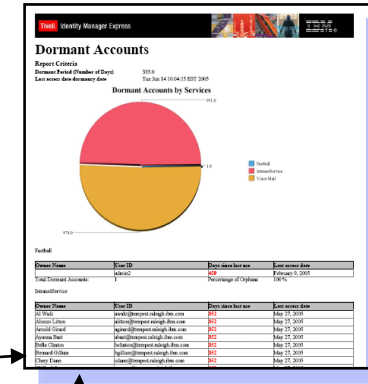
- Users have a single console in which to Visualize, Control, and Automate the management of any agent managed by AMS.
- Agents can be managed AS-IS, leading to fast time to value for our customers and the ability to quickly enable agents that are new to the portfolio.
- Agents that need to stay up and running 24x7 can be made more reliable through the AMS watchdog mechanism.
- Agents that do not need to stay up and running 24x7 can be started only when needed by using AMS as a proxy to their management servers.
- Users can AMS-enable their own agents on their own time table



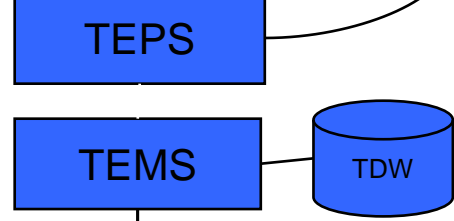
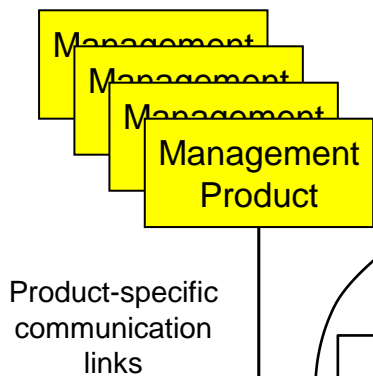
# AMS Architecture

Node	Alert Group	Summary	Last Occurrence	Count	Type	Agent	Manager	Alert Key
EAPOVED01.sageh.b...	Status	Node Down	02/17/2008 07:40:15 AM	2	Problem	Tivoli NotView	not on line	EAPOVED01.sageh.b...
abbeba.sageh.b...	Status	Node Down	02/17/2008 02:21:05 AM	1	Problem	Tivoli NotView	not on line	abbeba.sageh.b...
BMV145F0052LH1...	Status	Node Down	02/16/2008 07:47:35 PM	1	Problem	Tivoli NotView	not on line	BMV145F0052LH1...
sharta.sageh.b...	Status	Node Down	02/16/2008 06:07:20 PM	1	Problem	Tivoli NotView	not on line	sharta.sageh.b...
labandh.sageh.b...	Status	Node Down	02/16/2008 06:07:20 PM	1	Problem	Tivoli NotView	not on line	labandh.sageh.b...
lgshano0302744...	Status	Node Down	02/16/2008 06:07:20 PM	1	Problem	Tivoli NotView	not on line	lgshano0302744...
EAPOVED01.sageh.b...	Status	Interface 9.27.144.153 down, CRITICAL	02/17/2008 07:40:15 AM	2	Problem	Tivoli NotView	not on line	9.27.144.153
rombus	WEBSTOP	Attempt to login as root from host rombus failed	02/17/2008 06:33:37 AM	7	Problem	Tivoli NotView	Security	
ms7	ms7	ms7 probe on line: Heartbeat Message	02/17/2008 08:17:13 AM	583	Type N...	ms7	Probeblach	ms7
con.sageh.b...	Status	Interface 9.27.144.151 down, CRITICAL	02/16/2008 05:47:26 PM	1	Problem	Tivoli NotView	not on line	9.27.144.151
ALBERT4180.sage...	Status	Interface 9.27.144.151 down, CRITICAL	02/16/2008 05:27:27 PM	1	Problem	Tivoli NotView	not on line	9.27.144.151
lgshano0302744...	Status	Interface 9.27.144.140 down, CRITICAL	02/16/2008 05:27:25 PM	1	Problem	Tivoli NotView	not on line	9.27.144.140

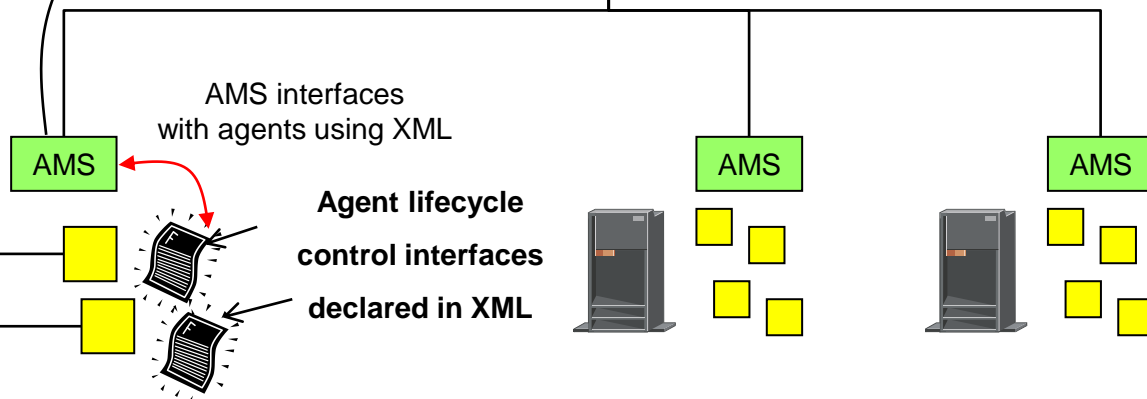
Unhealthy agent alerts



Operational & Historical reporting of agent downtime



Communication link to AMS



start, stop, status

Database monitor  
syslogd probe  
Remote Control  
Other

# Overview

- Customer Value:
  - ▶ Provides fault-tolerance for agent applications by monitoring and ensuring their availability.
  - ▶ Decreases the time-to-recovery of failed agent applications
  - ▶ Decreases the amount of configuration required to monitor for unhealthy agents
  - ▶ Provides historical information on frequency of unhealthy agent behavior and unexpected process termination to the Tivoli Data Warehouse.
  - ▶ Provides remote stop and start of agents which can help mitigate the effects of resource-intensive agents (turn them off when you don't need them)
  - ▶ Provides recycle of agents so that configurations can be changed and quickly activated
- Product:
  - ▶ Embeds watchdogging and auto-restart functions into OS Monitoring Agents and provides a separate process (physical watchdog) specifically for monitoring OS agents themselves.
  - ▶ Provides an Agent Management Services workspace under Windows, Linux, and UNIX Managed System navigation nodes (see next slide).
  - ▶ Provides TakeActions that stop/start/recycle/reset daily restart count and enable/disable watchdogging for a given agent
  - ▶ Provides a pure event situation for critical availability status problems
  - ▶ Availability policies in the form of XML files provided by each supported agent install package.



# Install

- Planning
  - ▶ Planning & equipment/software requirements
    - Installed as part of OS Monitoring Agent for Windows, Linux, and UNIX packages
    - OS agent and its physical watchdog process are set up to watch one another and auto-restart one another by default; no additional configuration is necessary.



# Configure

- Planning
  - ▶ Agents can be put under management by watchdog remotely using a TakeAction.
  - ▶ Centralized Configuration feature in FP2 supports the distribution of updated CAP files to owning OS agents. Availability management policies can be edited to override default values post-install and then they'll be automatically retrieved and enabled.
  
- Steps
  - ▶ Putting agents under management remotely
    - Select agent row from Agents' Management Status view, select "AMS Start Manage" action.
  - ▶ Manual editing of availability policy files
    - Can be done to change a default policy setting.
    - Do not update identifying information for agent unless you're certain about what you're doing. The watchdog uses the identifying information to locate the agent on the file system and identify it in the OS process table.
    - Make the updated policy file available on a central web server and use the Centralized Configuration Facility against the OS agent (DISP=PASCAP)
  - ▶ Verifying successful configuration
    - The Agents' Management Definitions view shows current policy file information
    - The Agent Availability Status column will reflect the current runtime status of the agent process. The Agents' Management Status view will show a value of 'Managed' for Agent Management Status.





## Use

- Monitor availability status of agents
- Stop a monitored agent such that it will not be auto-restarted by watchdog
- Start an agent and reset its daily restart count back to zero
- Check for critical events
- Look at message log to see AMS's activity
- Use tacmd to script starting and stopping agents through watchdog
- Check for critical events
- Temporarily disable all watchdogging, then re-enable it using disarmWatchdog and rearmWatchdog scripts.



# Use – Check Availability status and Daily Restart Count

The screenshot displays the 'Agent Management Services - SPARTAN - SYSADMIN' console. It features a 'Navigator' on the left with a tree view of system components. The main area is divided into several panels:

- Agents' Management Status:** A table showing the status of various agents.
- Agents' Alerts:** A table for alert messages.
- Agents' Runtime Status:** A detailed table showing the current state of agents, including availability and restart counts. A red circle highlights the 'Agent Availability Status' and 'Daily Restart Count' columns.
- Agents' Management Definitions:** A table defining the configuration for each agent.

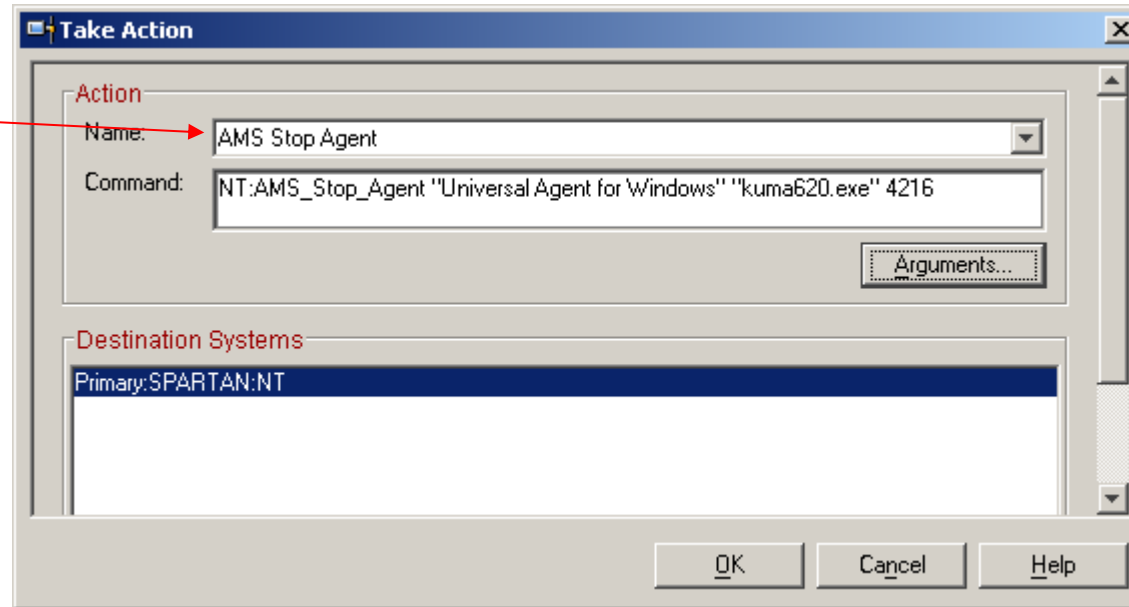
At the bottom, the console shows the 'Hub Time' as 'Thu, 10/09/2008 11:36 AM' and the 'Server Available' status.

All agents are running, and none have been auto-restarted today.

# Use – Stop an agent such that it will not be auto-restarted

AMS Stop Agent action allows agent to be stopped such that watchdog will not restart it.

Useful when temporary administrative activities are being performed against agent.



Agent Name	Timestamp	Agent Availability Status	Daily Restart Count	Process Name	Process ID	Agent Type	Operating System
Notepad	10/09/08 17:00:36	Running	0	notepad.exe	6116	Console	Windows
Proxy Agent Services Watchdog	10/09/08 17:00:36	Running	0	kcawd.exe	216	Win Service	Windows
Tivoli Warehouse Proxy Agent	10/09/08 17:00:36	Running	0	khdxprto.exe	4348	Win Service	Windows
Universal Agent for Windows	10/09/08 17:00:36	Manually Stopped	0	kuma620.exe	0	Win Service	Windows
Warehouse Summarization and Pruning Agent	10/09/08 17:00:36	Running	0	ksy610.exe	5292	Win Service	Windows

Universal Agent is now in a Manually Stopped state

# Use – Start a remediated agent, resetting its daily restart count

The screenshot shows the Tivoli Agent Management Services console with the following sections:

- Agents' Management Status:**

Agent Name	Timestamp	Agent Management Status	Manager
Notepad	10/09/08 17:19:17	Managed	Agent Managem...
Proxy Agent Services Watchdog	10/09/08 17:19:17	Managed	Agent Managem...
Tivoli Warehouse Proxy Agent	10/09/08 17:19:17	Managed	Not Managed
Universal Agent for Windows	10/09/08 17:19:17	Managed	Not Managed
- Agents' Alerts:**

Timestamp	Alert Message	Agent Name
10/09/08 17:09:34	Agent abnormally stopped	Notepad
10/09/08 17:18:36	Agent abnormally stopped	Notepad
10/09/08 17:19:06	Agent abnormally stopped	Notepad
10/09/08 17:19:06	Agent exceeded restart count	Notepad
- Agents' Runtime Status:**

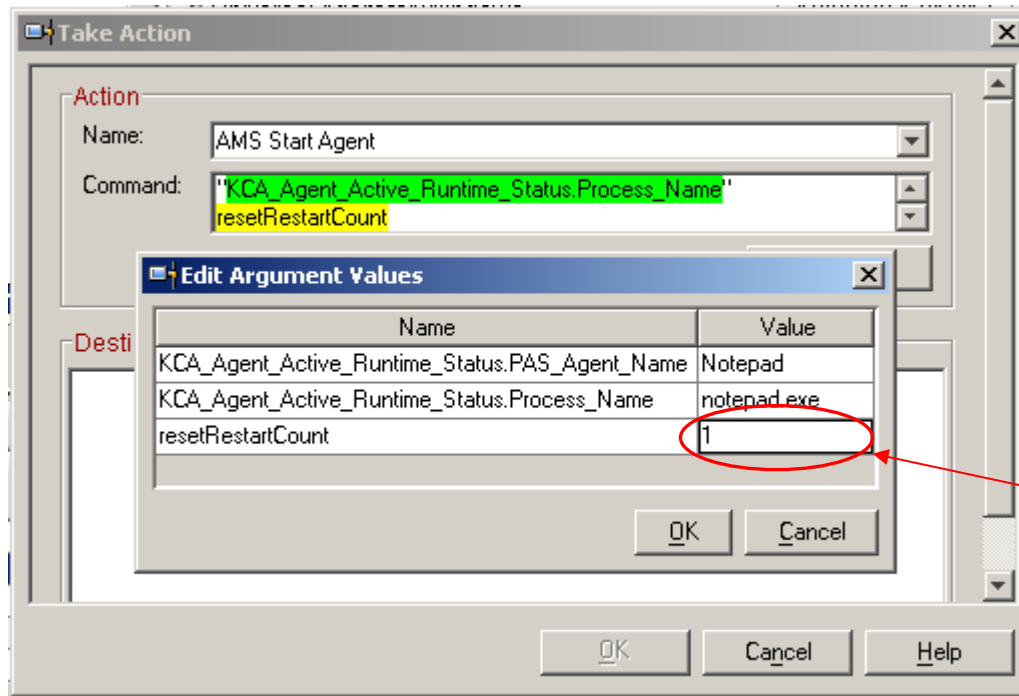
Agent Name	Timestamp	Agent Availability Status	Daily Restart Count	Process Name	Process ID	Agent Type	Operating System
Notepad	10/09/08 17:19:17	Running	0	notepad.exe	4388	Console	Windows
Notepad	10/09/08 17:19:17	Stopped	2	notepad.exe	0	Console	Windows
Proxy Agent Services Watchdog	10/09/08 17:19:17	Running	0	kcawd.exe	216	Win Service	Windows
Tivoli Warehouse Proxy Agent	10/09/08 17:19:17	Running	0	khdxppto.exe	4348	Win Service	Windows
Universal Agent for Windows	10/09/08 17:19:17	Running	0	kuma620.exe	4984	Win Service	Windows
- Agents' Management Definitions:**

Agent Name	Agent Type	Maximum Daily Restarts	Memory Threshold	Memory Unit	% CPU Threshold	Timestamp	Server Name
Notepad	Agent Services	2	0	Bytes	0	10/09/08 17:19:17	Primary:SPARTAN:NT
Proxy Agent Services Watchdog	Agent Services	4	10	MB	0	10/09/08 17:19:17	Primary:SPARTAN:NT
Tivoli Warehouse Proxy Agent	Agent Services	4	0	Bytes	0	10/09/08 17:19:17	Primary:SPARTAN:NT
Universal Agent for Windows	Agent Services	4	0	Bytes	0	10/09/08 17:19:17	Primary:SPARTAN:NT

Once the Max Daily Restarts policy setting has been exceeded the watchdog will no longer auto-restart an agent. It is in 'Stopped' State.

# Use – Start a remediated agent, resetting its daily restart count

Once the agent application has been fixed, the auto-restarting can be re-enabled by telling the watchdog to reset the agent's daily restart count. The AMS Start Agent action has a parameter to indicate this.



By default, this parameter is '0'. Only set it to '1' to tell the watchdog to reset the daily restart count (like a boolean).

Agent Name	Timestamp	Agent Availability Status	Daily Restart Count	Process Name	Process ID	Agent Type	Operating System
Notepad	10/09/08 17:29:40	Running	0	notepad.exe	4388	Console	Windows
Notepad	10/09/08 17:29:40	Running	0	notepad.exe	328	Console	Windows
Proxy Agent Services Watchdog	10/09/08 17:29:40	Running	0	kcaawd.exe	216	Win Service	Windows
Tivoli Warehouse Proxy Agent	10/09/08 17:29:40	Running	0	khdxprto.exe	4348	Win Service	Windows
Universal Agent for Windows	10/09/08 17:29:40	Running	0	kuma620.exe	4984	Win Service	Windows

The agent is started and its daily restart count is 0 again.

# Use – Check for critical events

The screenshot displays the Tivoli Agent Management Services - SPARTAN - SYSADMIN interface. It features a menu bar (File, Edit, View, Help), a toolbar, and a Navigator pane on the left showing a tree view of system components like 'Summarization and Pruning Agent', 'Universal Agent', 'Warehouse Proxy', and 'Windows OS'. The main area contains several data panels:

- Agents' Management Status:** A table listing agents and their management status.
- Agents' Alerts:** A table showing alerts, with one alert highlighted in red: 'Agent abnormally stopped' for the 'Notepad' agent.
- Agents' Runtime Status:** A table showing the current status of agents, including availability, restart counts, and process names.
- Agents' Management Definitions:** A table providing details on agent configurations, such as policy file timestamps, PAS IDs, and agent paths.

At the bottom, the status bar shows 'Hub Time: Thu, 10/09/2008 05:10 PM', 'Server Available', and the application name 'Agent Management Services - SPARTAN - SYSADMIN'.

# Use – Look at Message Log workspace to see PAS's activities

The screenshot shows the 'Agents' Management Log - SPARTAN - SYSADMIN' window. The left-hand 'Navigator' pane shows a tree structure with 'Agent Management Services' selected. The main pane displays a table of log messages:

Global Timestamp	Message Number	Managed System Type
10/16/08 13:39:37	ITAMS002	Tivoli Warehouse Proxy Agent Management Event: Agent now managed.
10/16/08 13:37:25	ITAMS007	Proxy Agent Services Watchdog Operational Event: Agent started successfully.
10/16/08 13:37:25	ITAMS022	Proxy Agent Services Watchdog Operational Event: Agent initial start
10/16/08 13:36:54	ITAMS000	C:\IBM\ITM\TMAITM6\CAP\kum.xml CAP File Event: Agent added to system - CAP file found.
10/16/08 13:36:54	ITAMS000	C:\IBM\ITM\TMAITM6\CAP\ksy.xml CAP File Event: Agent added to system - CAP file found.
10/16/08 13:36:54	ITAMS000	C:\IBM\ITM\TMAITM6\CAP\kntcma.xml CAP File Event: Agent added to system - CAP file found.
10/16/08 13:36:54	ITAMS000	C:\IBM\ITM\TMAITM6\CAP\khd.xml CAP File Event: Agent added to system - CAP file found.
10/16/08 13:36:54	ITAMS000	C:\IBM\ITM\TMAITM6\CAP\kca.xml CAP File Event: Agent added to system - CAP file found.

This is just the OS agent log filtered on PAS specific messages.



# Use – Different availability policies for different instances of agent

The screenshot displays the 'Agent Management Services' interface for 'WOLVERINE.raleigh.ibm.com - SYSADMIN'. It features a 'Navigator' on the left showing a tree view of system components like Disk, Enterprise Services, Memory, Network, Printer, Process, Processor, and System. The main area contains several panels:

- Agents' Management Status:** A table listing agents with columns for Agent Name, Timestamp, and Agent Management Status. Two rows are highlighted with a red box: 'Agentless Monitoring for Windows Operating Systems: SNMP\_Instance' and 'Agentless Monitoring for Windows Operating Systems: WMI\_Instance'.
- Agents' Alerts:** A table with columns for Timestamp, Alert Message, Alert Details, and Agent Name.
- Agents' Runtime Status:** A table with columns for Agent Name, Timestamp, Agent Availability Status, Process Name, and Instance Name. Four rows are highlighted with a red box, showing the runtime status for the generic, SNMP, and WMI instances.
- Agents' Management Definitions:** A table with columns for Agent Name, Policy File Timestamp, PAS ID, Process Name, Agent Type, and Agent Path. Three rows are highlighted with a red box, corresponding to the generic, SNMP, and WMI policies.

At the bottom, the interface shows 'Hub Time: Fri, 04/23/2010 04:51 PM', 'Server Available', and the application title 'Agent Management Services - WOLVERINE.raleigh.ibm.com - SYSADMIN'.

Agent name is qualified by policy instance name so user can correlate policy to running Instance.

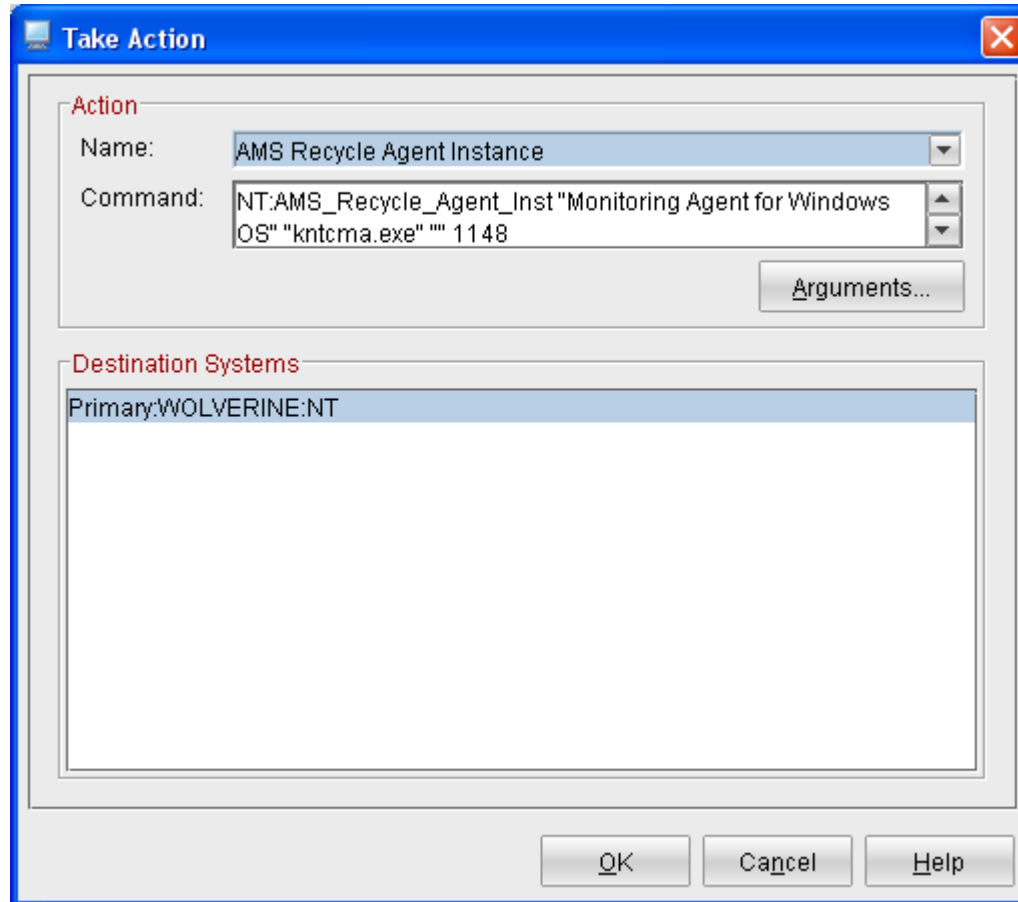
Two Default instances governed by generic policy  
SNMP instance has SNMP policy, WMI instance has WMI policy

Three policies:  
Two custom  
One generic



# Use – Recycle the OS monitoring agent

Will cause a Critical AMS alert saying that watchdog has been temporarily disabled.



## Use – Use tacmd to script start/stop manage, start/stop agents

- Put agent under PAS management (start management)

```
tacmd executeaction -n "AMS Start Management" -t nt -m "Primary:SPARTAN:NT" -c value="Universal Agent for Windows"
```

- Remove agent from PAS management (stop management)

```
tacmd executeaction -n "AMS Stop Management" -t nt -m "Primary:SPARTAN:NT" -c value="Universal Agent for Windows"
```

- Start agent

```
tacmd executeaction -n "AMS Start Agent" -m "Primary:SPARTAN:NT" -t nt -c value="Proxy Agent Services Watchdog", "kcawd.exe"
```

- Stop agent

```
tacmd executeaction -n "AMS Stop Agent" -m "Primary:SPARTAN:NT" -t nt -c value="Proxy Agent Services Watchdog", "kcawd.exe", "4716"
```

- Recycle an instance of an agent

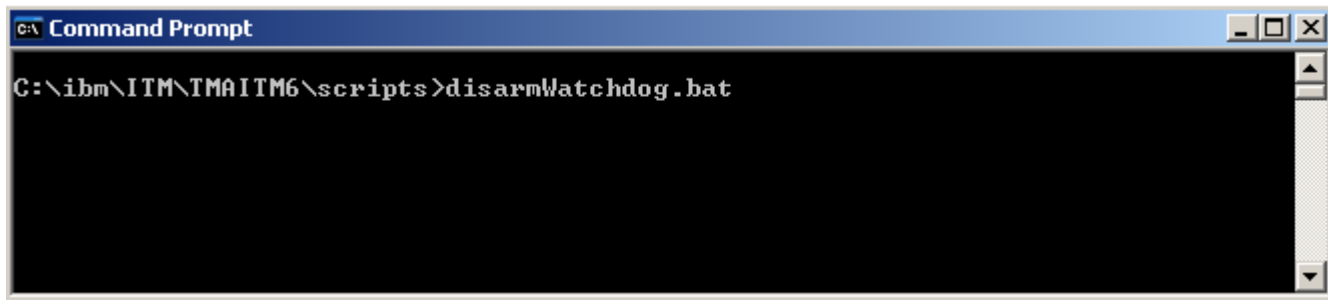
```
tacmd executeaction -n "AMS Recycle Agent Instance" -t nt -m "Primary:SPARTAN:NT" -c value="Monitoring Agent for Windows OS", "kntcma.exe"
```

- Reset the daily restart count of an agent

```
tacmd executeaction -n "AMS Reset Agent Restart Count" -t nt -m "Primary:SPARTAN:NT" -c value="Monitoring Agent for Windows OS", "kntcma.exe"
```



## Use – Temporarily disarm watchdog, then rearm



```
C:\ Command Prompt
C:\ibm\ITM\TMAITM6\scripts>disarmWatchdog.bat
```

This stops the kcawd process such that the OS agent will not restart it. Then it signals the OS Agent that PAS is in 'disarm mode' so that it does not auto-restart any of the agents it is managing. And, since kcawd is stopped, allows administrator or programs (installer) to stop the OS agent without it being restarted. Starting the OS agent resets everything back to normal.



```
C:\ Command Prompt
C:\ibm\ITM\TMAITM6\scripts>rearmWatchdog.bat
```

This signals the OS agent to come out of disarm mode. Once it does, it will see that its physical watchdog is stopped and will automatically restart it.



# Integration

- Overview
  - ▶ Integrates with TEC and Omnibus event adapters using facilities of OS agent
  - ▶ Integrates with Tivoli Data Warehouse if historical data collection is enabled for the Agent Management Services tables.
  - ▶ Integrates with the ITM Agent Builder and Factory
- Steps
  - ▶ For OMNibus, AMS events forwarded from TEMS to OMNibus EIF probe like all other events
  - ▶ For TEC, AMS events are already added to knt.baroc, klz.baroc, and kux.baroc. Simply compile them into your TEC rulebase.



# Tuning Parameters

- `KCA_CAP_DIR=@BinPath@\CAP`
  - ▶ Allows AMS to locate CAP files in context of OS agent's environment
- `KCA_CMD_TIMEOUT=30`
  - ▶ Default max time in seconds that AMS watchdog will wait for stop/start/health check commands to complete. Retries start commands 3 times; retries health check 1 time; does not retry stop command. If they don't complete, will issue events.
- `KCA_DISCOVERY_INTERVAL=30`
  - ▶ How frequently to check for newly started managed instances
- `KCA_DISCOVERY_ITM_INTERVAL = 10 minutes`
  - ▶ How frequently to check for newly configured but not started managed instances
- `KCA_DISCOVERY_CAP_INTERVAL = 30`
  - ▶ How frequently to check for added/removed CAP files in `KCA_CAP_DIR` directories



# CAP files

- CAP files (same file used on all OS platforms, no need to maintain one for each OS). All ITM and Tivoli agents have CAP files, the list below is just a subset.
  - ▶ kntcma\_default.xml – OS Monitoring Agent for Windows
  - ▶ klz\_default.xml – OS Monitoring Agent for Linux
  - ▶ kux\_default.xml – OS Monitoring Agent for UNIX
  - ▶ khd\_default.xml – Warehouse Proxy Agent
  - ▶ kum\_default.xml – Universal Agent
  - ▶ kul\_default.xml – UNIX Log Agent
  - ▶ kca\_default.xml – Physical watchdog
  - ▶ kr2\_default.xml – kr6\_default.xml – Agentless agents

The suffix “default” means that these files came from IBM. Users who wish to modify settings should remove the default file, create a separate copy named k<pc>.xml, add desired settings, then move to CAP directory.



# Reference Materials

- **Product pub sections and readme information that cover component/function.**
  - ▶ Ch. 11 of ITM v6.2.2 FP 2 Administrator's Guide
  - ▶ Windows, Linux, UNIX OS Agent Guides.
- **Whitepapers, IBM Redbooks, DCF docs, forums, etc.**
  - ▶ "How to create Common Agent Package files.pdf". Will be put on <http://www.ibm.com/developerworks/wikis/display/tivolimonitoring/home>
- **TTEC: GOs**
  - ▶ Link to where presentation and recording will be
  - ▶ Links to previous presentations and recording (pre 2008)
- **GO Labs:**
  - ▶ Links to all this and other related GO Labs



# QUESTIONS??

