

**Tivoli Event Integration**  
Technology White Paper

December 11, 2002  
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**Abstract**

This document focuses on the technical issues surrounding Lexmark's Tivoli Event Integration adapter. The intent of this document is to cover issues and details that are not covered in other MarkVision Professional publications.

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**Edition: December 2002**

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## **1. Overview**

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### **1.1 Summary**

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It is typical in large corporate networks to find a centralized support staff that maintains the corporation's network infrastructure through the use of comprehensive systems management and network management applications. Tivoli develops management applications and infrastructure that targets this market. Lexmark continues its tradition of adding value to such management applications by integrating Lexmark's network printer alert technology within the Tivoli Management Environment (TME). We have developed a custom "event adapter" which can feed Lexmark printer generated NPAP alerts into the Tivoli Event Console, or T/EC as it is more commonly known. This custom "event adapter" has been integrated directly into the MarkVision Messenger product.

### **1.2 Audience**

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This white paper is intended for sales engineers, technical sales representatives, customers who make decisions for or are involved in the day-to-day support of managing networks. Readers should be familiar with the Tivoli Management Environment and Tivoli products.

### **1.3 Availability**

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Tivoli Event Integration is currently available as part of MarkVision Messenger.

### **1.4 Supported Environments**

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Lexmark's event integration solution for Tivoli will run on all platforms supported by MarkVision Messenger.

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## 2. Tivoli Event Integration

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### 2.1 Technical Overview

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The key component that integrates Lexmark's printer alert technology into the Tivoli Event Console is a customized event adapter built directly into MarkVision Messenger. It leverages the same network infrastructure that MarkVision Messenger uses in order to convert printer generated NPAP alerts into Tivoli events.

The custom event adapter, which has been directly integrated into MarkVision Messenger, converts printer generated NPAP alerts into events that are recognizable by the Tivoli Event Server. A new event class, MVP\_Printer\_Alert, is derived from Tivoli's base event class so that printer specific information can be captured and recorded in a Tivoli event. The following defines the new MVP\_Printer\_Alert event class:

```
TEC_CLASS:
  MVP_Printer_Alert ISA EVENT
  DEFINES
  {
    source:                default = "MVP_PRINTERS";
    severity:              default = WARNING;
    Printer_Address:      STRING;
    Printer_Model:        STRING;
    Port_Attachment:      STRING;
    Adapter_Product:      STRING;
    Ipx_Address:           STRING;
    Description:          STRING;
    Notes:                STRING;
    User_Data:            STRING;
    Serial_Number:        STRING;
    Property_Tag:         STRING;
    Contact_Name:         STRING;
    Contact_Location:     STRING;
    Alert_State:          STRING;
    Location:             STRING;
    Type:                 STRING;
  };
END
```

### 2.1.1 Supported Printers

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Please reference the "MarkVision Professional White Paper" documentation for a list of supported devices.

### 2.1.2 Supported Alerts

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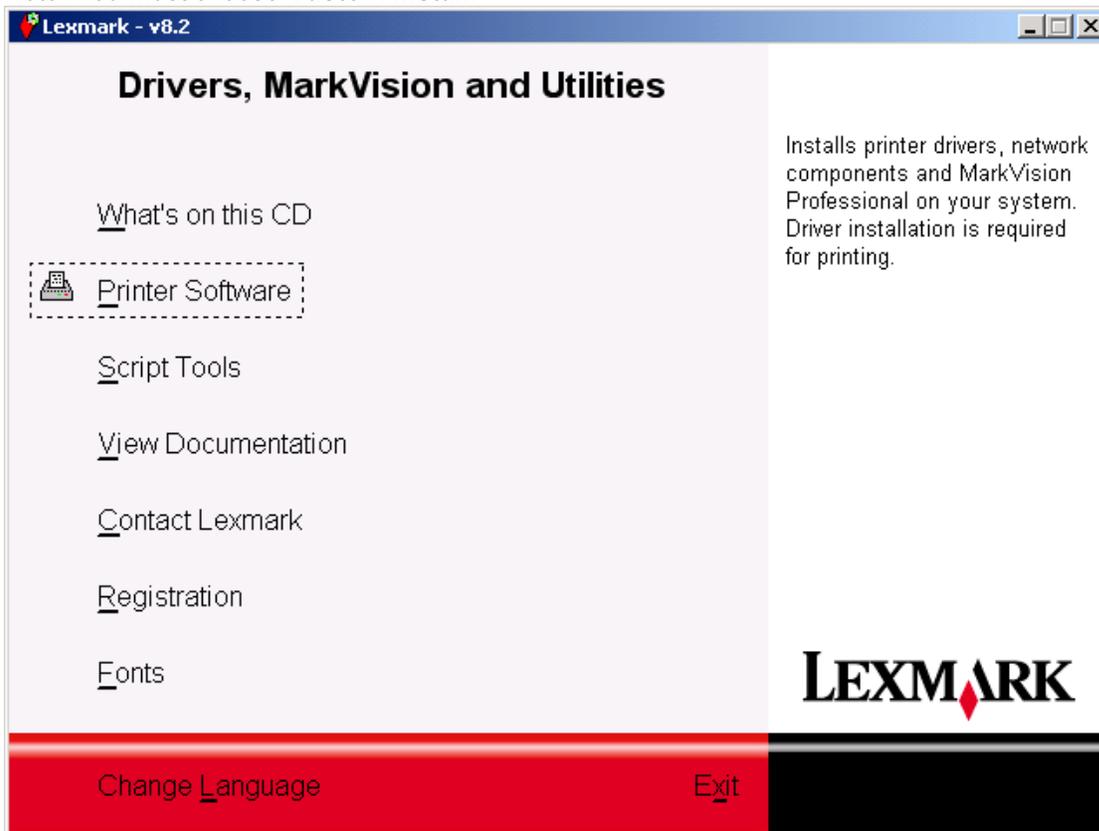
Please reference the "MarkVision Messenger White Paper" documentation for a list of supported alert conditions. Alerts are converted using their severity (Errors/Warnings) into Tivoli's Critical/Warning classification.

## 2.2 Installation

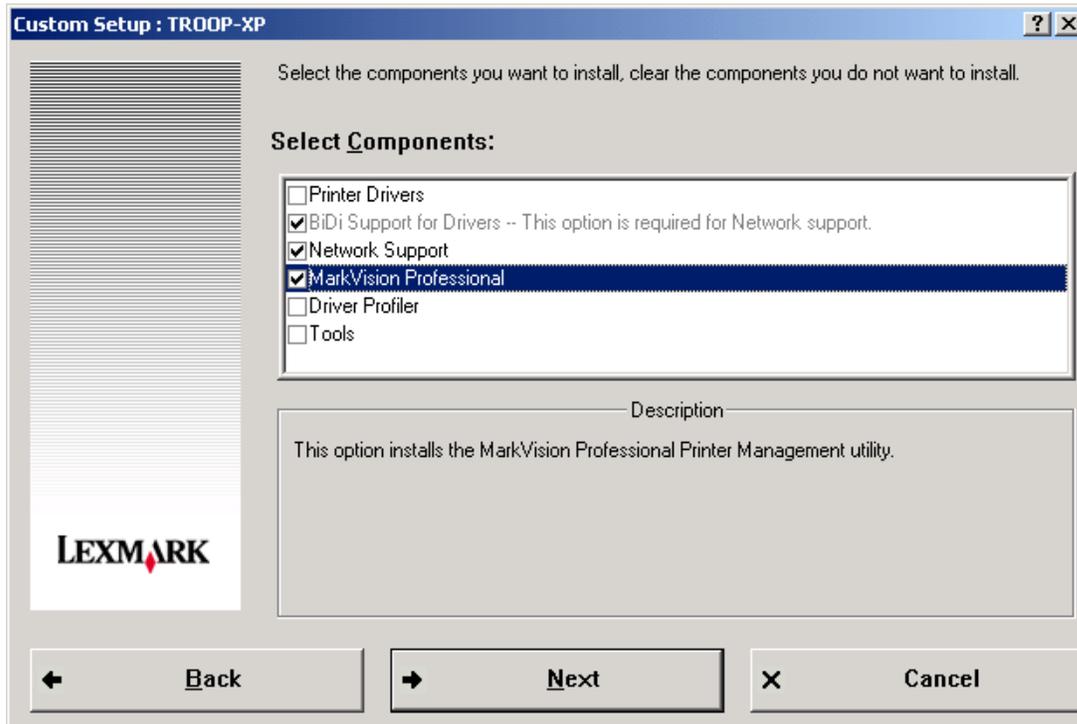
---

Lexmark's event integration solution for Tivoli is available as part of the MarkVision Professional management suite, specifically integrated with MarkVision Messenger. The MarkVision Professional installation can be reached by selecting **Printer Software** from the CD installation screen.

Note: You must choose **Custom install**.

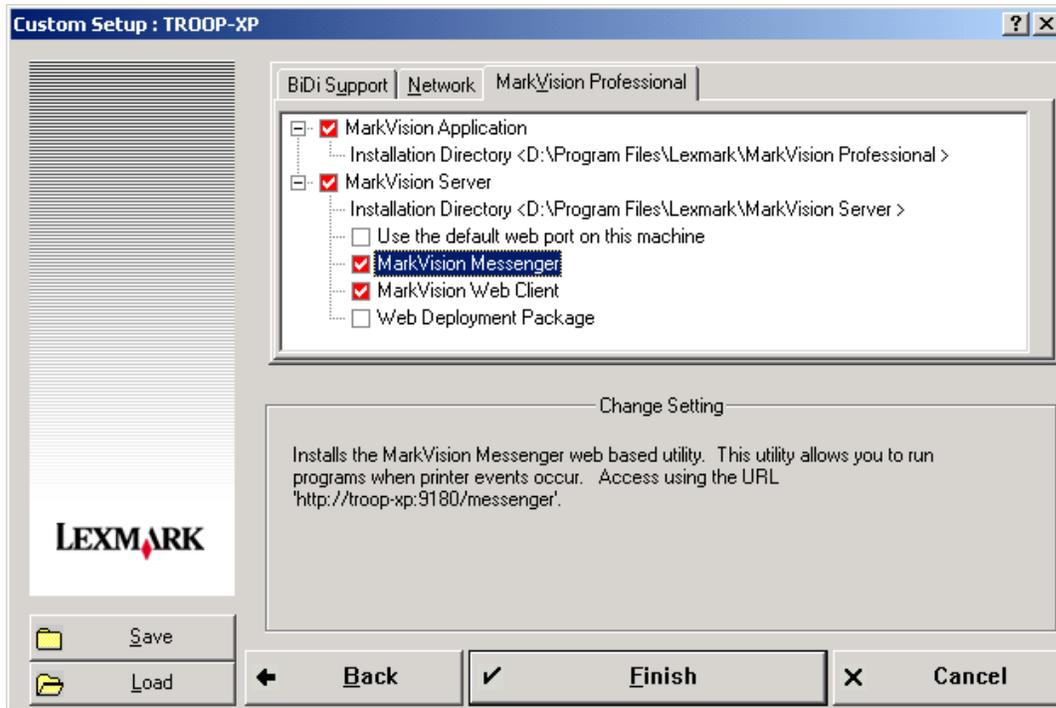


As part of the Custom Setup installation, an option is included to install the MarkVision Professional components needed to configure Lexmark's custom event adapter for Tivoli.



The **MarkVision Professional** tab will reveal the optional MarkVision Professional components that can be installed. Because the custom event adapter for Tivoli is integrated directly into MarkVision Messenger, at a minimum, the following components must be selected for installation:

- MarkVision Server
- MarkVision Messenger
- MarkVision Application or MarkVision Web Client



Once the installation has completed, the event adapter must be created and configured using MarkVision Messenger. The following section shows the steps necessary to configure the Tivoli Event Adapter in MarkVision Messenger.

## 2.3 Using MarkVision Messenger's Integrated Tivoli Event Adapter

### 2.3.1 Overview of MarkVision Messenger

MarkVision Messenger is a tool that provides a mechanism for automating responses to printer conditions. The heart of MarkVision Messenger is a "service" that runs inside of the MarkVision Server. To use this service, the user creates "actions" using a browser-based interface, either by selecting "MarkVision Messenger Launch" from the actions menu, or utilizing the URL. If your MVP web server is set as the default server on the machine, use **http://<yourserver>/messenger** within your browser, otherwise you must include the port in the URL, **http://<yourserver>:9180/messenger**. Once an action is created and enabled, the browser can be closed because the action will be enforced by the messenger service running inside the MarkVision Server.

An "action" created in MarkVision Messenger contains several key pieces of information. Using MarkVision Messenger's intuitive wizard based interface the action is defined according to the following parameters:

- The printer conditions or folder changes for which the user would like notification
- The printers or folders in which the user is interested
- The function to perform when a printer event occurs

### 2.3.2 Creating and Configuring a Tivoli Event Adapter in MarkVision Messenger

Open the MarkVision Messenger browser-based interface, either by selecting "MarkVision Messenger Launch" from the actions menu in MarkVision Professional, or by utilizing the URL described in the previous section.

The MarkVision Messenger main screen should appear as follows:



Click on **Create New** to create a new action. This action will be the basis of the Tivoli Event Adapter.

On the following screen, enter a descriptive name for the new action. You may also wish to enter a description and a note for this action. If supplied, the note and the description will show up in the details field for each event that is sent to the Tivoli Event Server.

Configure Action - Descriptive Information - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Refresh Print

Address <http://157.184.32.237/messenger/servlet/messenger> Go Links

 **LEXMARK**  
**MarkVision Messenger**

Help



All the information you enter below can be embedded in command lines, e-mail messages, etc.

**Name: (required)** ⓘ  
Enter a short, descriptive name for your Action.

**Description: (optional)**  
Enter a longer description of your Action.

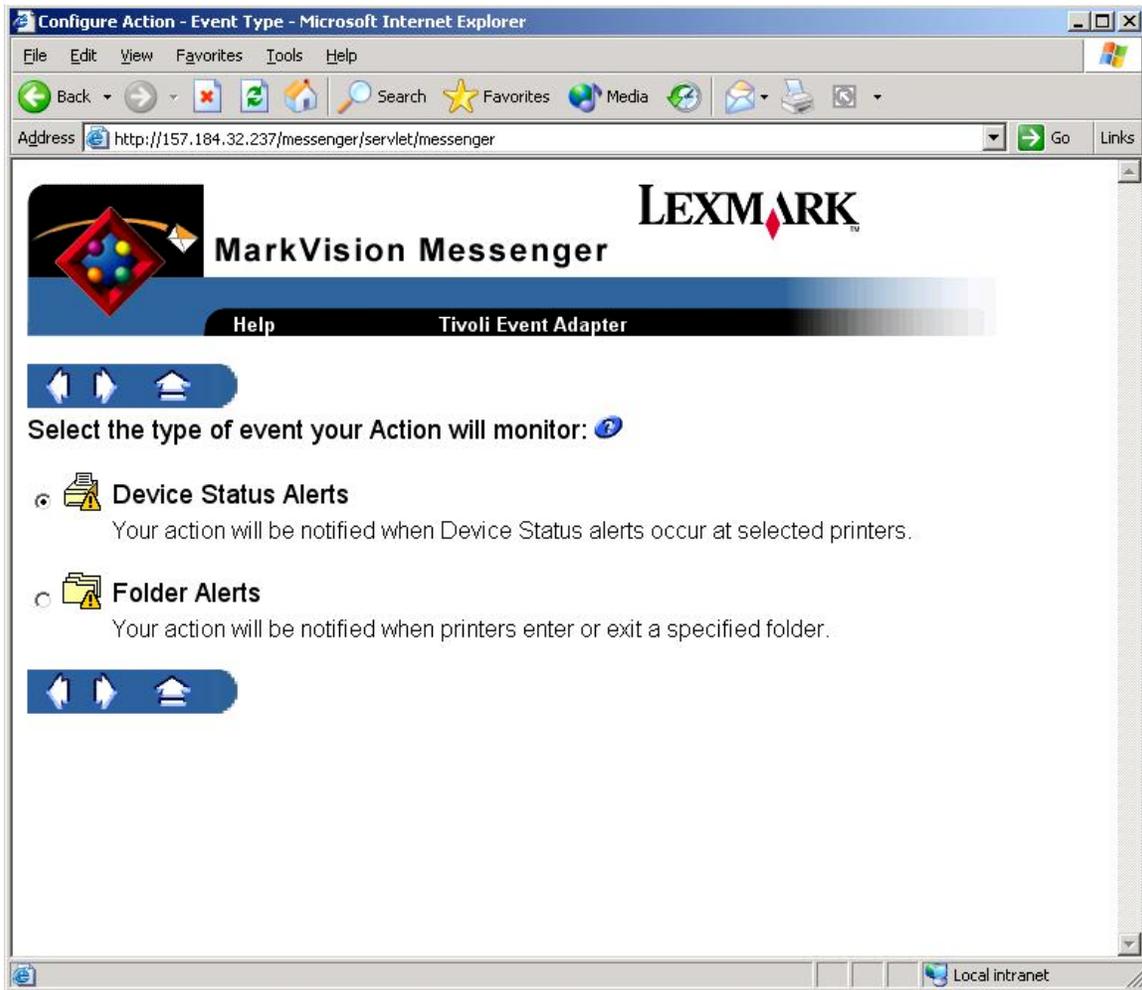
**Notes: (optional)**  
Enter any additional information you wish to associate with your Action. For example, if this Action responds to printers that are low on toner, you might want to enter a contact person or the room where toner is stored.

Done Local intranet

Once the required data has been entered, click the right-arrow icon to go on to the next screen where you will choose the type of event to monitor.

**Note:** The Tivoli Event Adapter included in MarkVision Messenger will be available in a subsequent part of the wizard *only* if the type of event selected on this screen is **Device Status Alerts**.

Make sure the Device Status Alerts radio button is selected then click the right-arrow icon to continue the setup wizard.

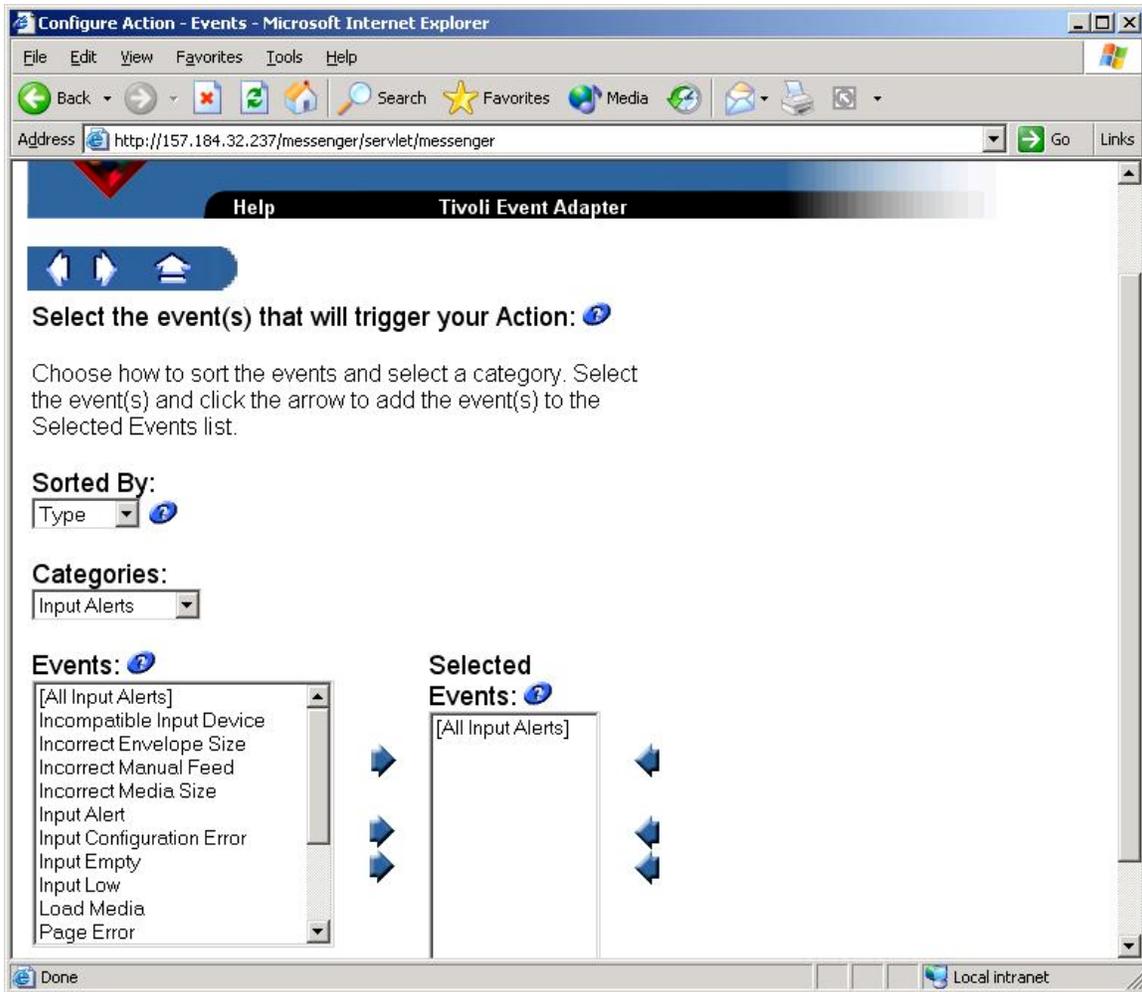


At this point in the setup wizard, you will need to configure the type of printer-related status alerts (or events) that will cause an event to be sent to the Tivoli Event Server.

You may wish to monitor devices for alerts of a certain *severity*, e.g., only those events that have a severity of "Error", or you may choose to monitor a set of devices for alerts of a certain *type*, e.g., "Input Alerts", "Output Alerts", or "Supplies Alerts".

To choose which type of events to monitor, make appropriate selections in the **Events** scroll box, and then click the single, solid right-arrow to move your selections to the **Selected Events** box.

Once you have completed your selection, click the right-arrow icon at the top or bottom of the screen to continue with the setup.

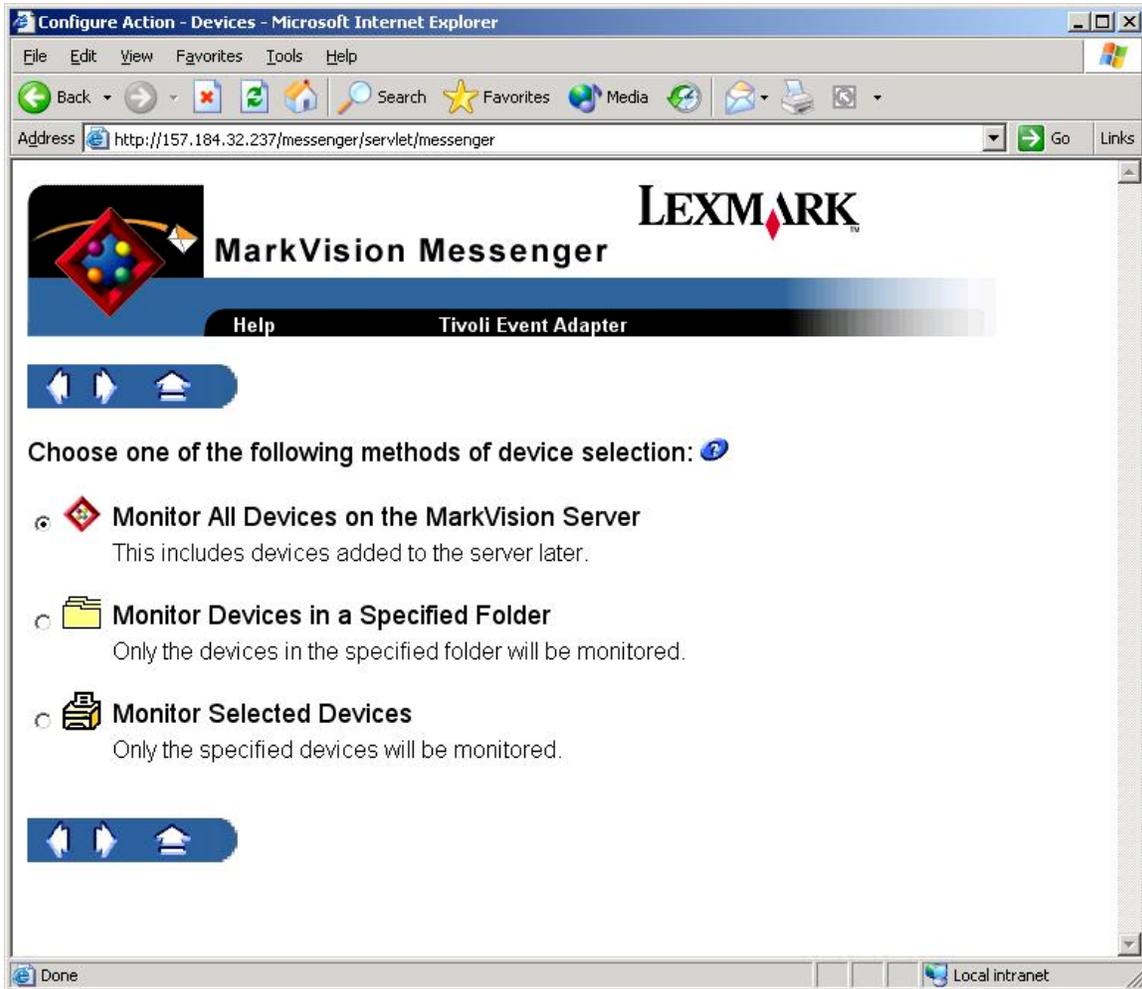


In the next screen of the setup wizard you must choose a method of device selection. The choices are as follows:

- Monitor All Devices on the MarkVision Server
- Monitor Devices in a Specified Folder
- Monitor Selected Devices

The titles should be fairly self-explanatory, but it should be noted that Messenger does not provide a means of adding devices to the MarkVision Server. Devices (printers) must be added to the MarkVision Server either by using the MarkVision Application or the MarkVision Web Client. See section 2.2 for details on installing these components.

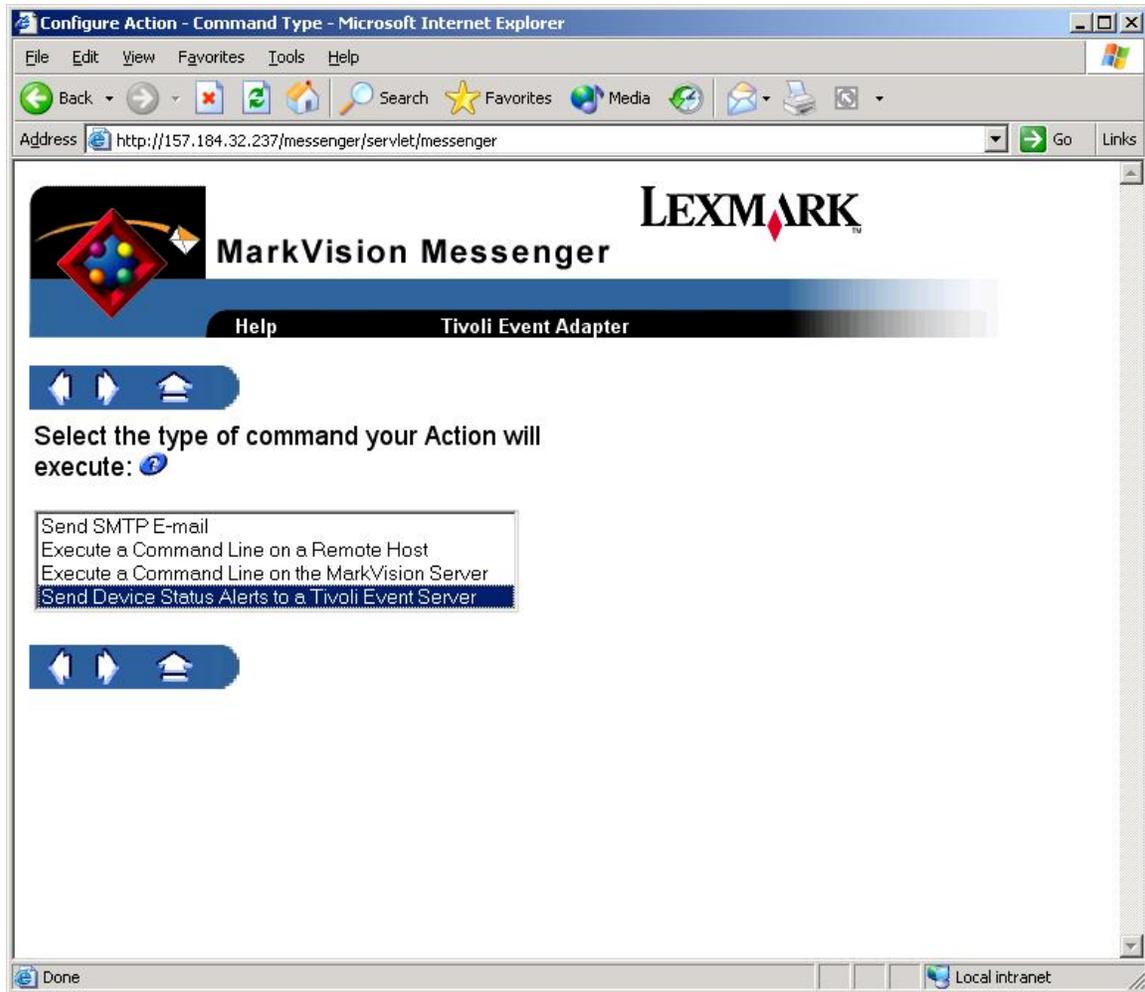
The device selection screen appears in Messenger as follows:



If the **Monitor Devices in a Specified Folder** radio button is selected, the next screen to appear will be the folder selection screen where you will be presented with a view of all the folders that have been configured on the MarkVision Server via the MarkVision Application or the MarkVision Web Client.

If the **Monitor Selected Devices** radio button is selected, the next screen to appear will present a list of all the devices currently on the MarkVision Server. From this list, you may choose which specific devices you would like to monitor for status alerts (events).

Otherwise, if the **Monitor All Devices on the MarkVision Server** radio button is selected, all devices currently on the MarkVision Server, as well as any devices added later, will be monitored for status alerts, and since there are no specific devices or folders to choose, you will be taken directly to the following screen:



This screen is where the custom event adapter for Tivoli, the one integrated directly into Messenger, is selected. From the list of command types, select the command entitled **Send Device Status Alerts to a Tivoli Event Server**, and then click the right-arrow icon to continue the setup process.

The subsequent screen is where you will configure the event adapter with information pertaining to your Tivoli Server configuration.

**Tivoli Setup - Microsoft Internet Explorer**

File Edit View Favorites Tools Help

Back Forward Home Search Favorites Media

Address <http://c07laptop:9180/messenger/servlet/messenger> Go Links >>

 **MarkVision Messenger** **LEXMARK**

Help Tivoli Event Adapter

Enter your Tivoli configuration settings.

**Server Location:**   
(tivoliserver.mycompany.com)

**Server Port:**   
(Defaults: 5529 for Windows; 0 for Unix)

**Event Buffer File:**   
(Examples: c:\temp\cache.dat for Windows; /tmp/cache.dat for Unix)

Local intranet

The parameters are as follows:

**Server Location:**

This is the hostname or IP address where the Tivoli Event Server resides.

**Server Port:**

This is the port on which the Tivoli Event Server listens for events. The port number can be any valid port between 0 and 65535, depending on how the Tivoli Administrator has configured the server. However, if the Tivoli Server is running on a Windows-based operating system, the default port is 5529. On Unix systems, the default port is usually 0 (zero), which is the standard port for portmapper. The TEC server registers itself with portmapper, which then listens for incoming Tivoli socket requests, redirecting the requests to the appropriate Tivoli service.

**Event Buffer File:**

This is where events are saved to disk if the TEC server can't be contacted. Once the server can be contacted, if this file is non-empty, then all events saved in the file are flushed to the server before sending the "current" event.

Once these parameters have been assigned, the user will then be taken directly to the wizard page for configuring the type of filter for the action. This is in contrast to the other command types in Messenger, which typically lead to pages where users define which alert information to

include with the command being executed. In order for the Tivoli Server to understand Lexmark printer alerts, however, a hard-coded set of alert values (called slots) had to be predefined on the Tivoli server by way of a Lexmark-specific alert class. This class is registered with the Tivoli Server upon installation of the "MarkVision Plus Module for Tivoli", and defines what values the Tivoli Server will accept from Messenger.

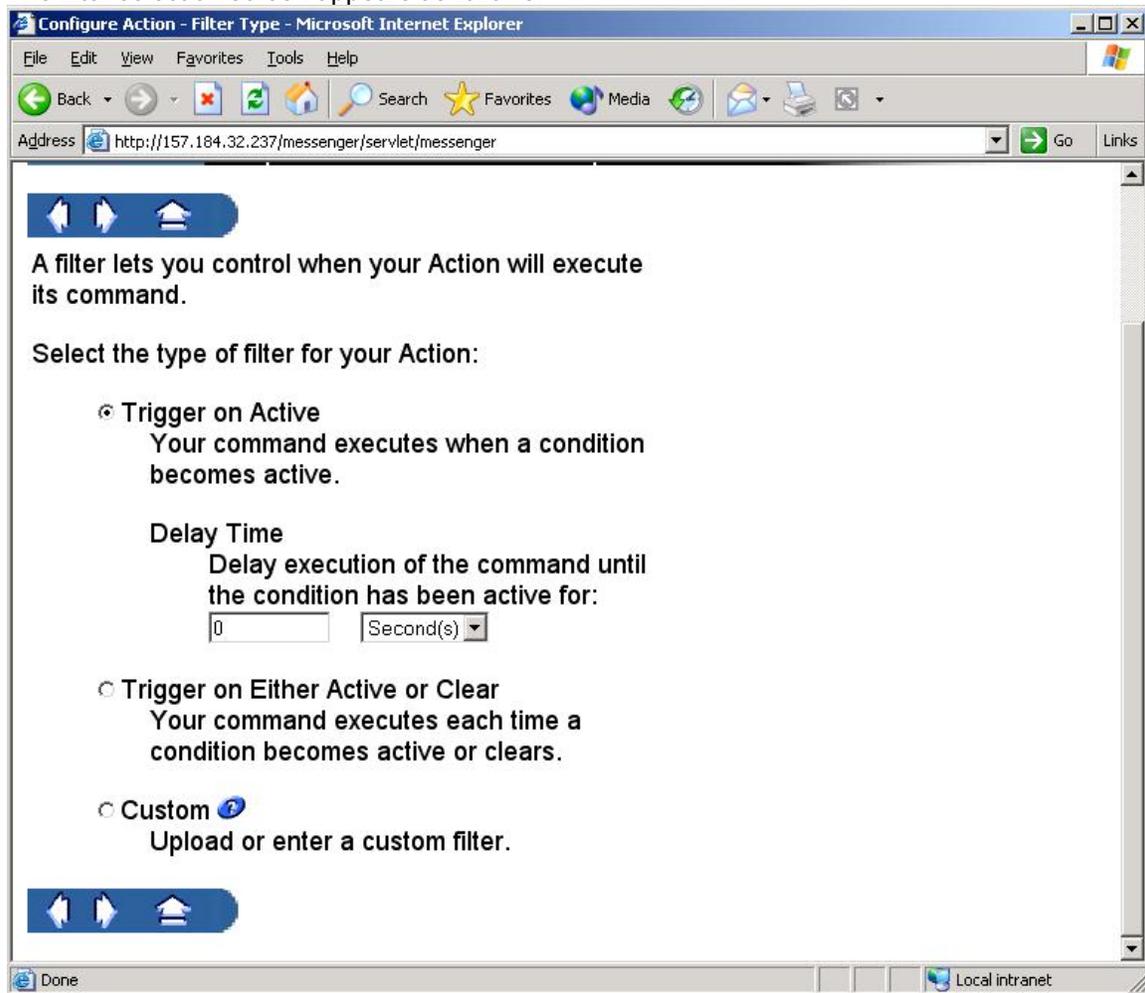
The predefined values from messenger that are included with each "Tivoli" alert are as follows:

- action.name
- action.description
- action.notes
- event.severity
- event.name
- source.model
- source.address
- source.ipHostname
- source.ipxAddress
- source.port
- action.sourcedata
- source.serialNumber
- source.propertyTag
- source.contactName
- source.contactLocation
- event.state
- event.location
- event.type

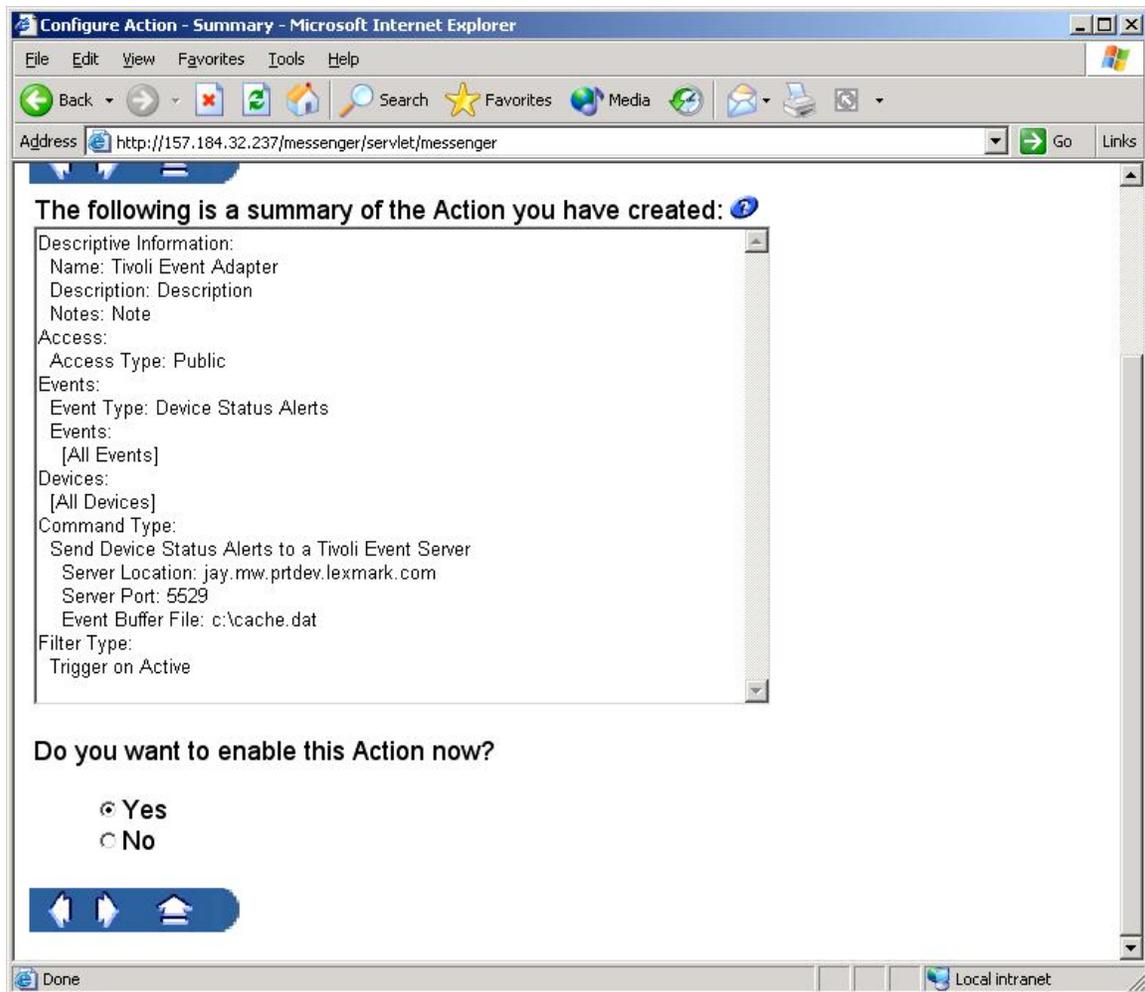
In addition, the "Tivoli" alert also contains the MAC address of the device.

Note that not all of these values will be present for each alert. For example, the source.ipxAddress will only be available if the device was discovered via IPX in MarkVision Professional.

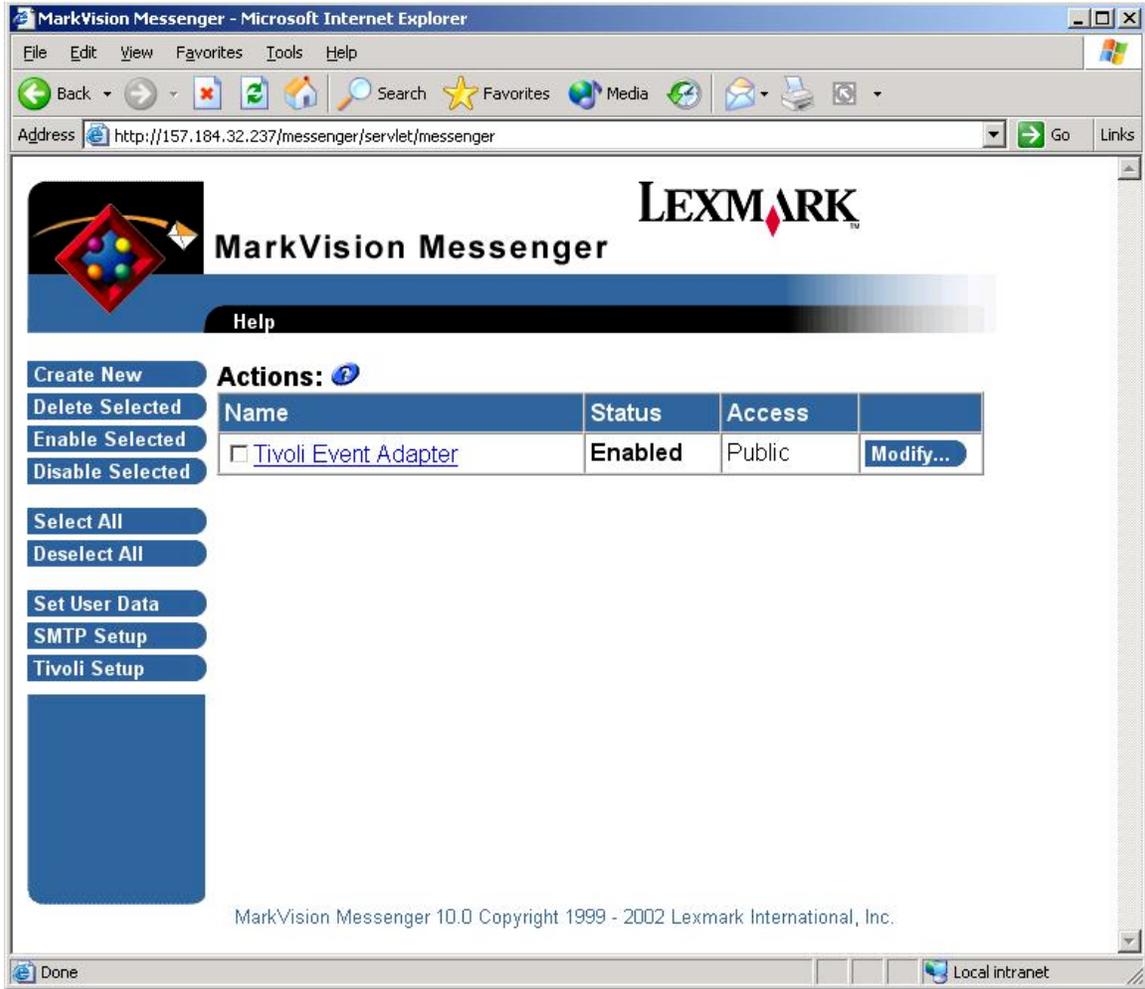
The filter selection screen appears as follows:



On the filter selection screen, choose when your action should execute, and then click the right-arrow icon to finish the setup wizard. The final screen will give you a summary of the settings you have chosen up to this point, and will allow you to enable the action.



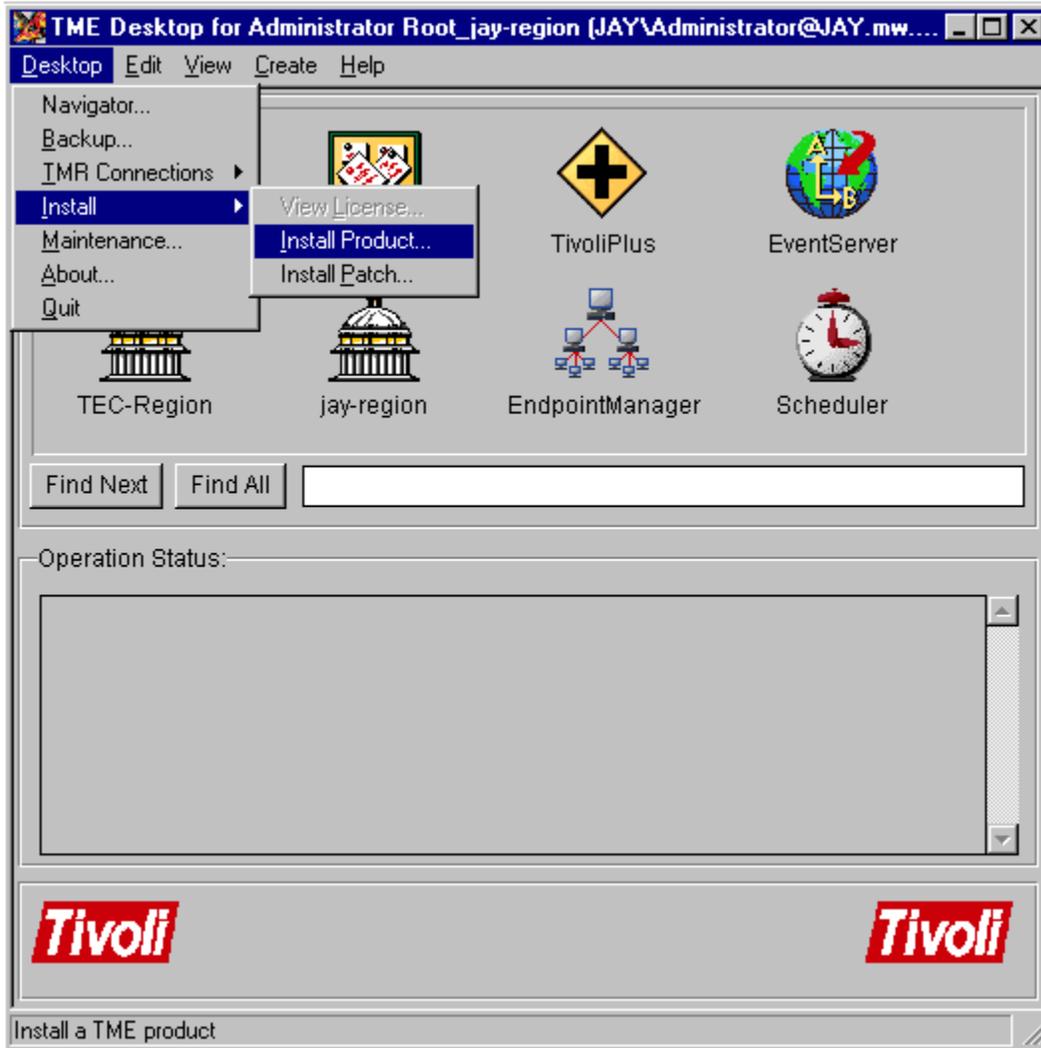
If the summary of the action is acceptable, select the radio button for **Yes**, and then click the right-arrow icon to enable the action for the Tivoli Event Adapter.



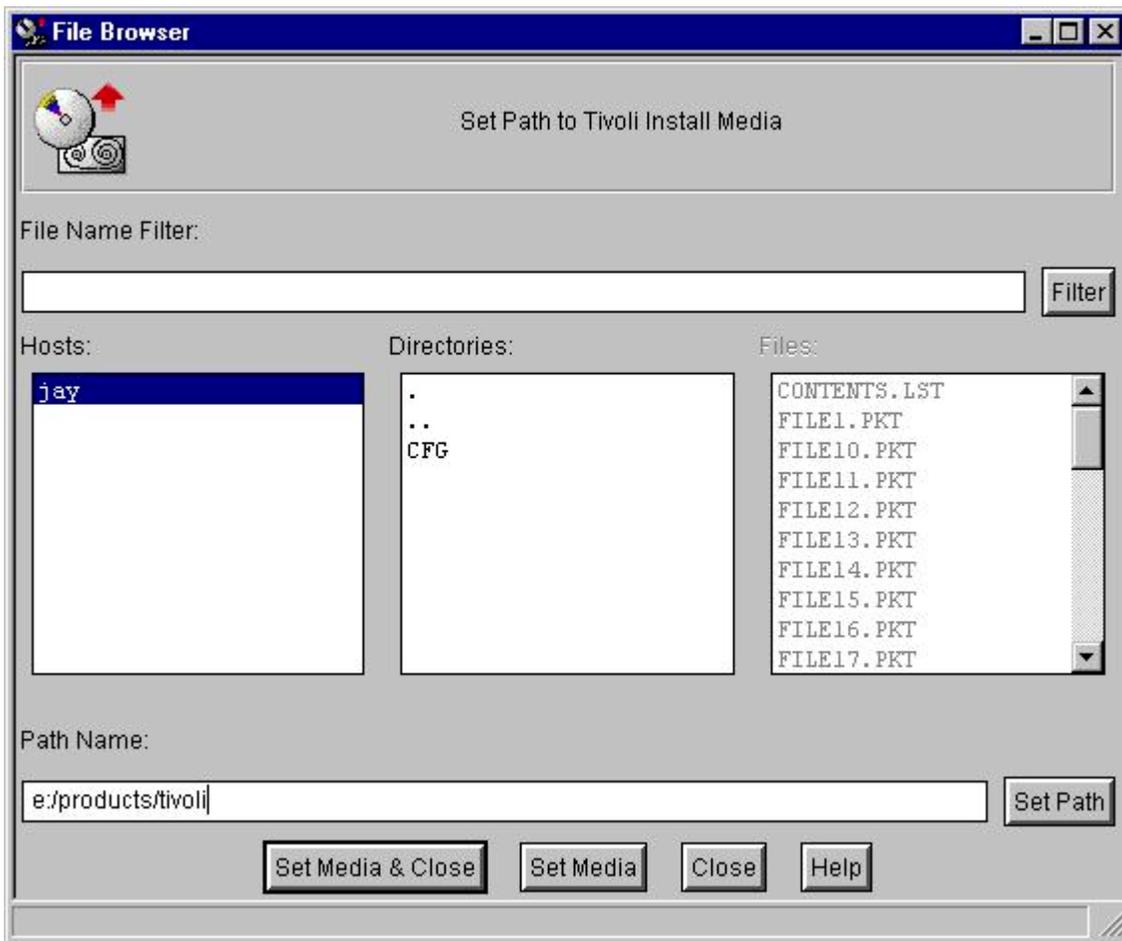
MarkVision Messenger is now configured to redirect device status alerts to a Tivoli Event Server. However, some additional steps must be performed on the Tivoli Server to complete the installation. Refer to section 2.4 entitled "Configuring the Tivoli Server for MarkVision Alerts" for further details.

## 2.4 Configuring the Tivoli Server for MarkVision Alerts

To complete installation and setup of the Tivoli Event Adapter, a Plus Module must be installed from the TME Desktop. This Plus Module contains a task, or script, which is used to configure the Tivoli Event Server to recognize new types of events that are generated by MarkVision Messenger's custom event adapter. To install the Plus Module, select "Install Product" from the TME Desktop as shown below:

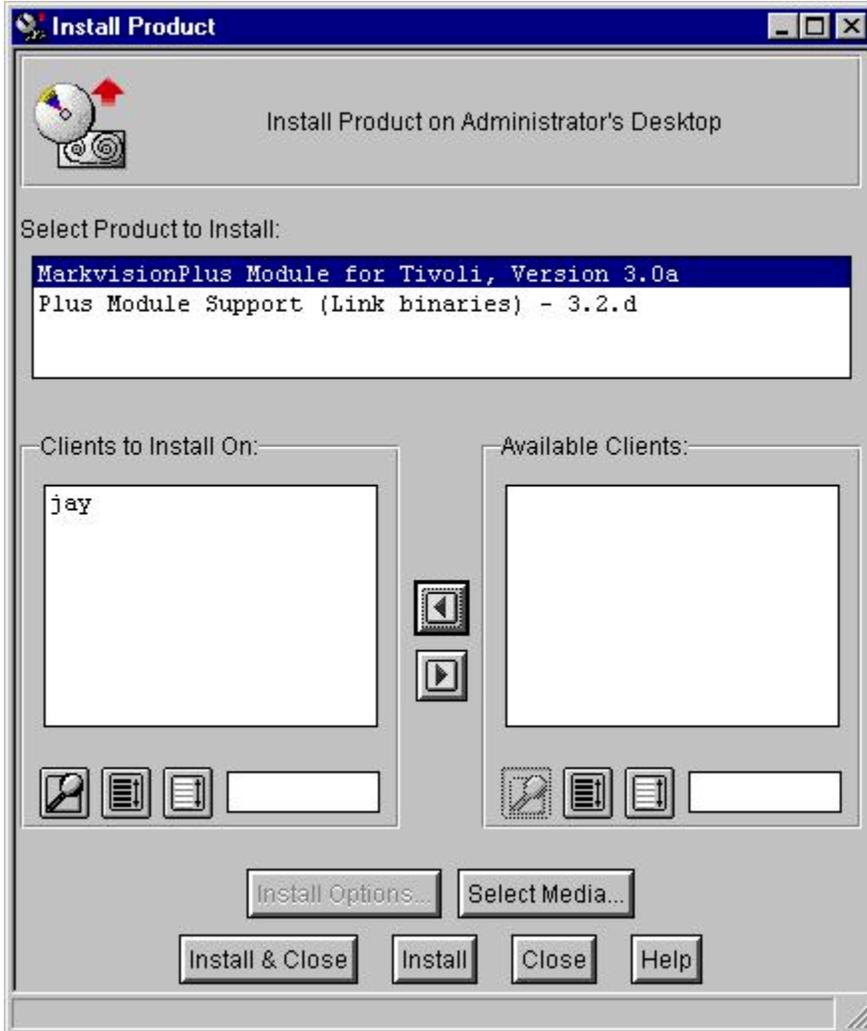


Use "Select Media..." to open the "File Browser" dialog, which is described below. In this dialog, navigate to the appropriate directory on the hard drive where the Plus Module resides, and select **Set Media & Close**.



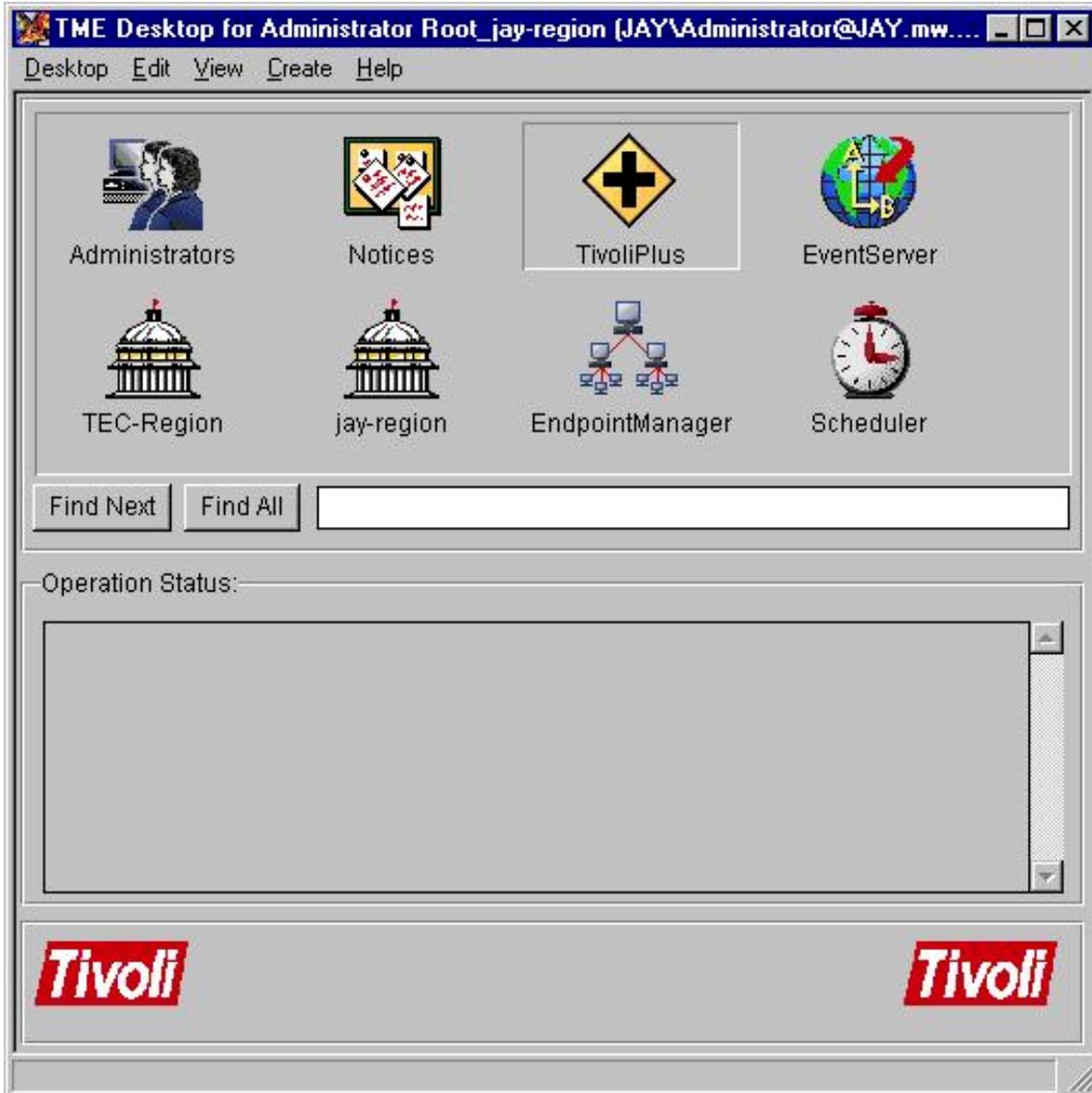
Select **MarkVisionPlus Module for Tivoli, Version 3.0a** and then select **Install & Close** to install the Plus Module as shown below:

**Note:** The **Plus Module Support (Link binaries) – 3.2.d** must be installed before attempting to install the MarkVisionPlus Module for Tivoli.

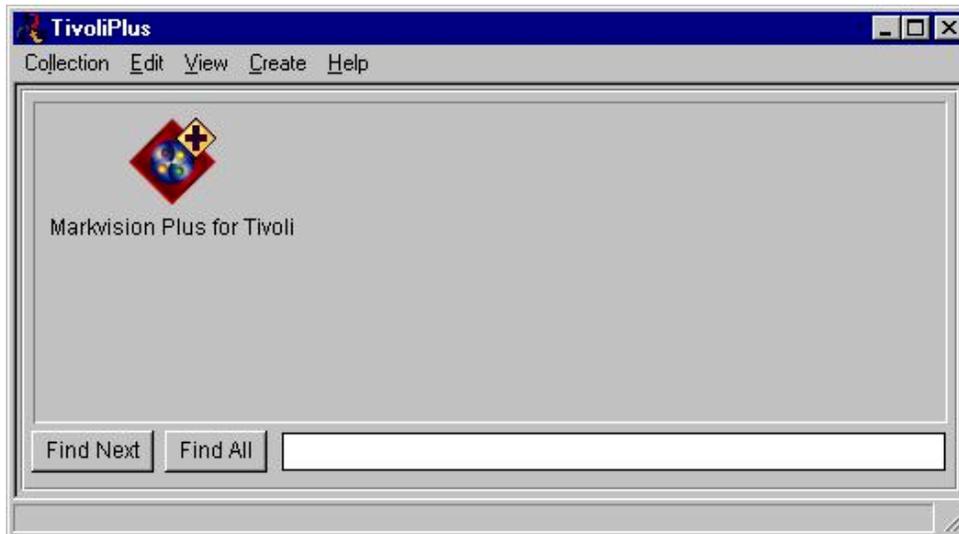


Once the MarkVision Plus Module is installed, the user can run a script that will setup the Tivoli Event Server to handle Lexmark defined printer events as shown in the following screen captures:

First, double-click the **TivoliPlus** icon on the TME Desktop:



In the window that opens, double-click the **Markvision Plus for Tivoli** icon:



In the subsequent window, double-click the **Setup\_TEC\_Event\_Server\_for\_Markvision** icon:



Upon double-clicking the **Setup\_TEC\_Event\_Server\_for\_Markvision** icon, a dialog window will appear prompting for the following pieces of information:

- Rule Base Name (new or existing):
- Rule Base to clone (if new):
- Path for Rule Base (if new):

The value for the “Rule Base Name (new or existing)” field should be: **markvision\_rb**

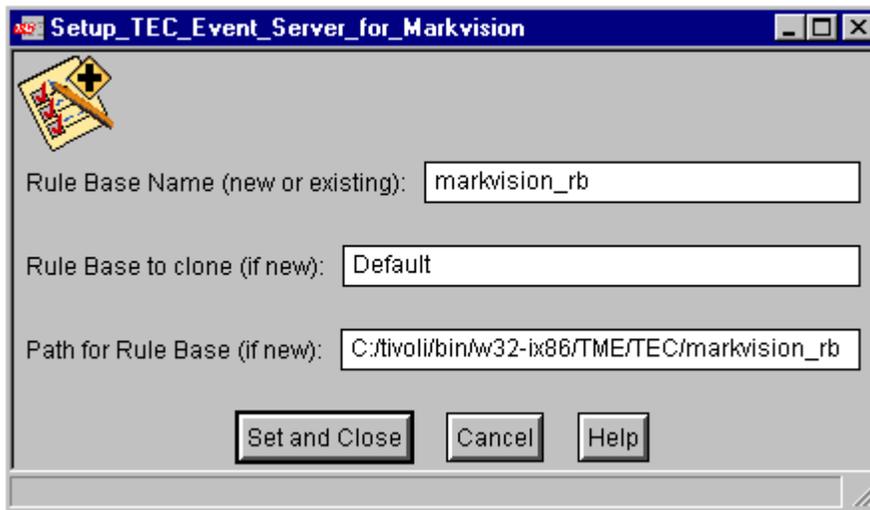
If this is the first time installing the MarkvisionPlus Module, the rulebase named markvision\_rb will not exist, therefore the name of the existing default rulebase must be supplied in the “Rule Base to clone (if new)” field.

If this is a new install, rather than an upgrade, the value for the “Rule Base to clone (if new)” field should be: **Default**

Otherwise, if you wish to upgrade the markvision\_rb, leave the “Rule Base to clone (if new)” field blank.

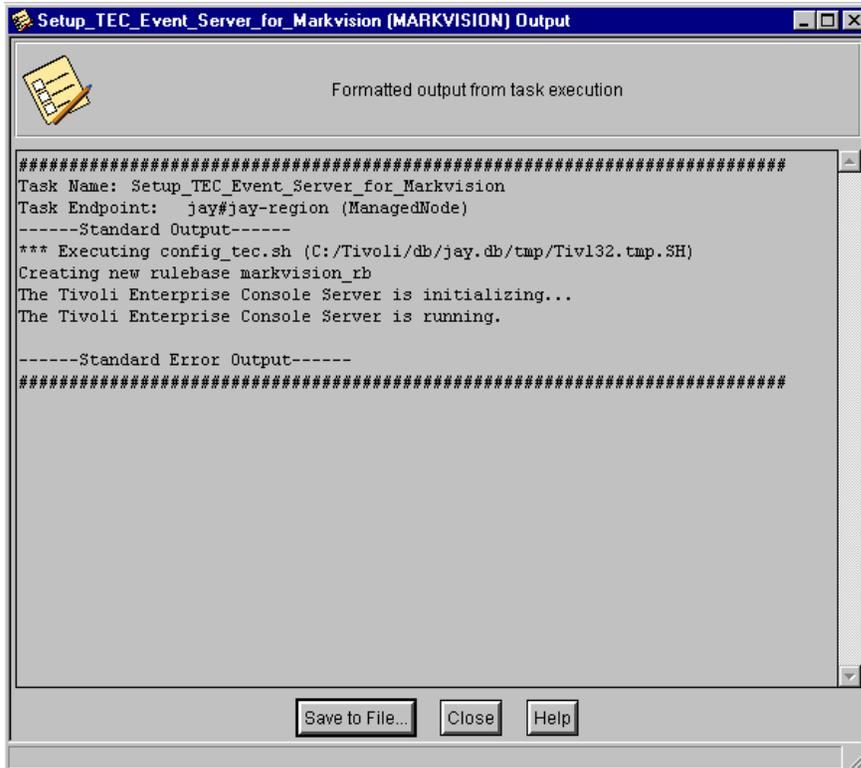
Finally, enter the path where the rulebase should be created. This can be any valid path, but if you wish to create the rulebase in the same location as the default rulebase, you will need to enter the following commands at the Tivoli bash prompt:

```
C:\>bash
bash$ wrb -lsrb -path
Rule Base Name Directory
-----
Default          jay:C:/Tivoli/bin/w32-ix86/TME/TEC/default_rb
```



Enter the appropriate values in the text boxes, and then click **Set and Close**.

The script will take some time to complete because it must register the MarkVision event class, then stop and restart the Tivoli Event Server. Once it is finished, a dialog like the following should appear:



```
Setup_TEC_Event_Server_for_Markvision (MARKVISION) Output
Formatted output from task execution

#####
Task Name: Setup_TEC_Event_Server_for_Markvision
Task Endpoint: jay#jay-region (ManagedNode)
-----Standard Output-----
*** Executing config_tec.sh (C:/Tivoli/db/jay.db/tmp/Tiv132.tmp.SH)
Creating new rulebase markvision_rb
The Tivoli Enterprise Console Server is initializing...
The Tivoli Enterprise Console Server is running.

-----Standard Error Output-----
#####

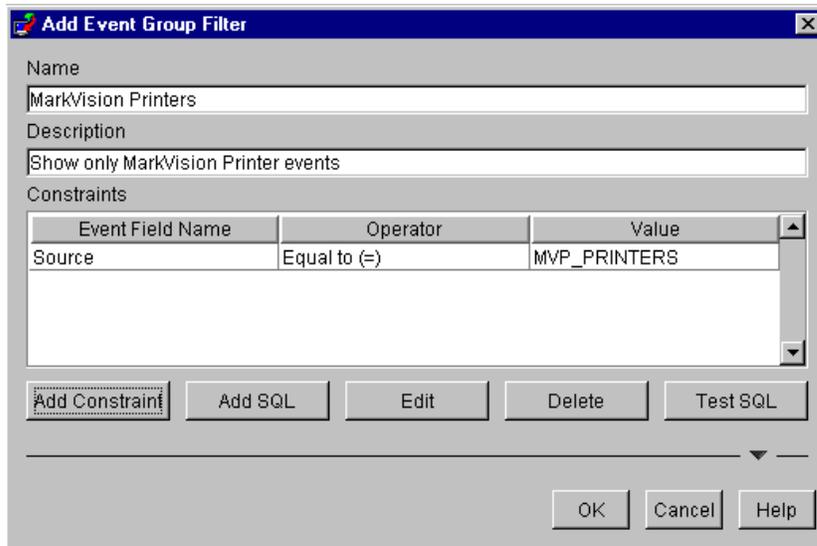
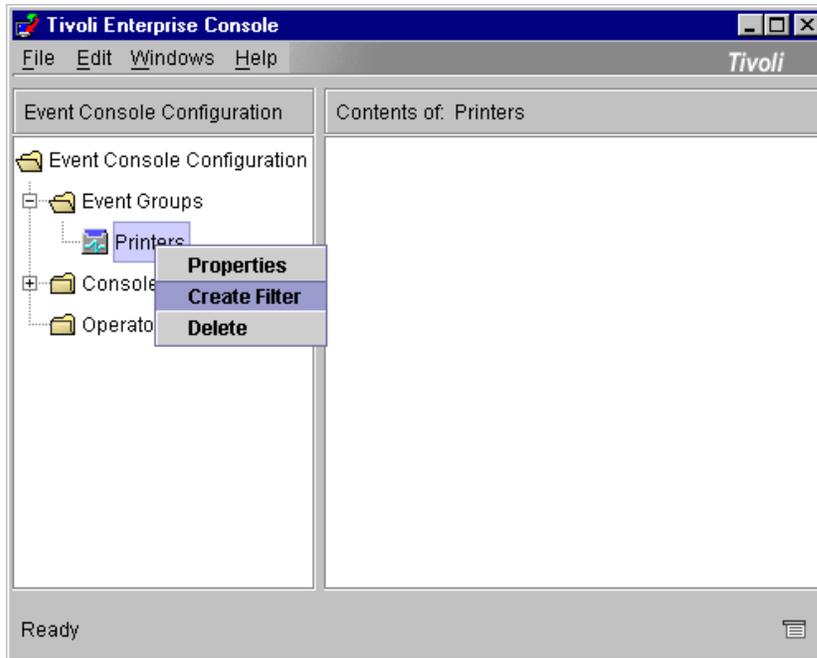
Save to File... Close Help
```

Congratulations, setup of the MarkvisionPlus Module for Tivoli is now complete!

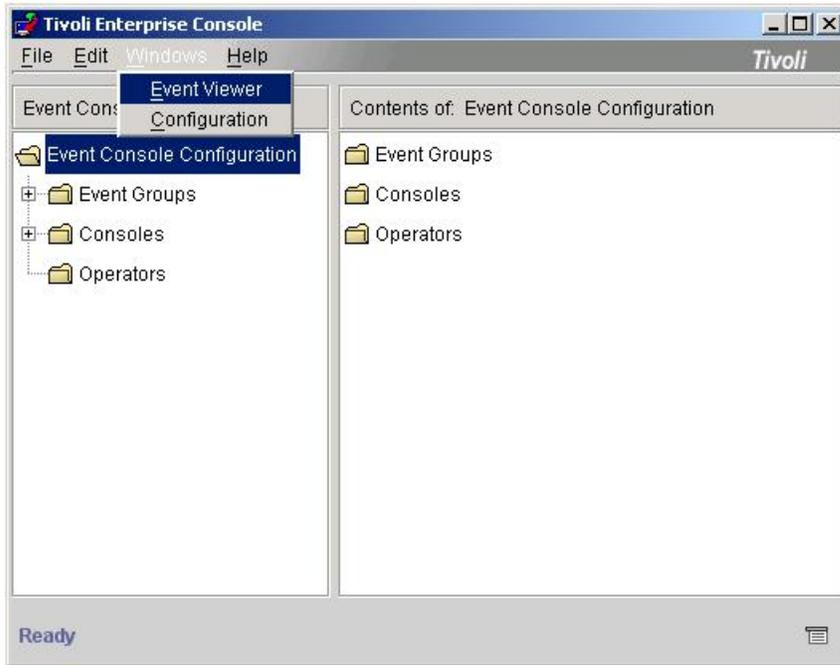
### 3. Tivoli Event Console (Java Edition)

The Tivoli Event Console (T/EC) provides the means by which an administrator can get enterprise-wide status from a central location. In previous versions, the console was integrated directly into the TME Desktop; for version 3.7 and later, however, the T/EC became a separate application written in Java. Please refer to your Tivoli documentation for details on how to install and launch the new Java T/EC.

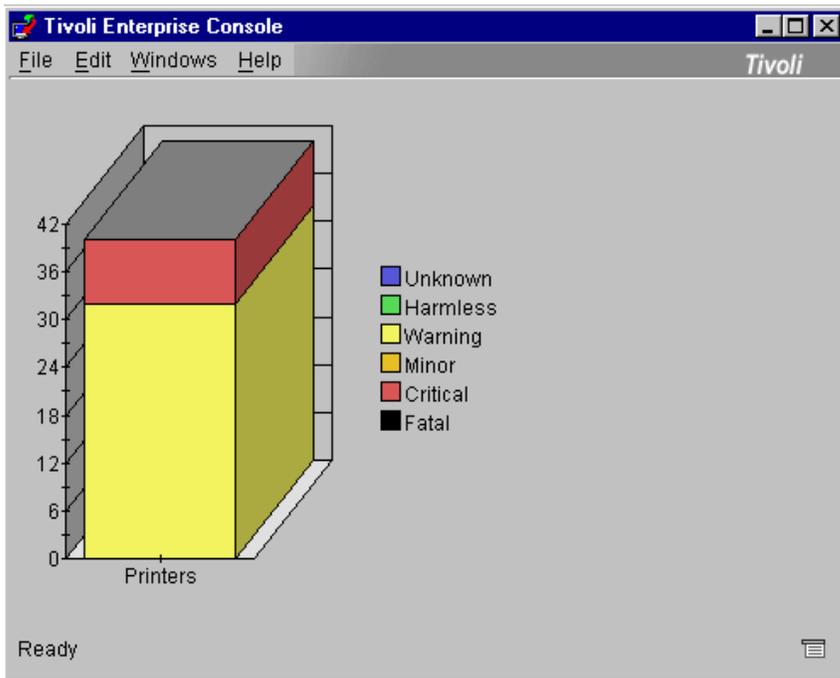
Once the Tivoli Event Server has been configured to recognize MarkVision printer alerts, a Tivoli user with Administrative privileges can log-in to the T/EC and create an event group with a filter that will show only events from MarkVision printers:



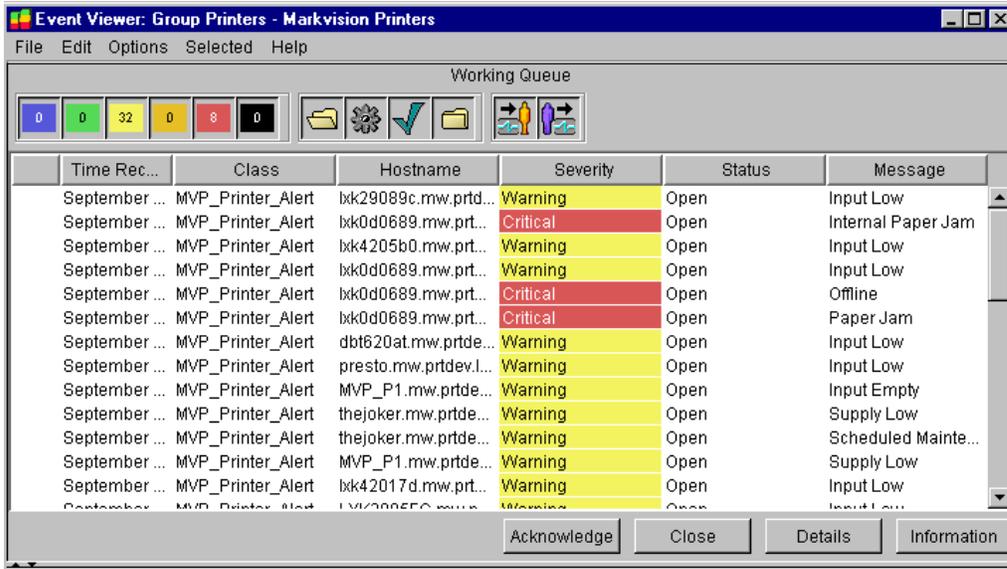
Once the filter has been properly configured, change to "Event Viewer" mode by clicking **Windows** → **Event Viewer** as shown below:



In "Event Viewer" mode, a bar-graph representation of the MarkVision printer events are then displayed as follows:



Clicking the bar chart displays the MarkVision printer events:



A full description can be viewed by highlighting an event then clicking the **Details** button:

