1. IBM Tivoli NetView Integration

A key problem for system management is understanding and diagnosing problems across the entire spectrum of a network, from devices through servers, middleware, and applications. Often application or server problems are actually caused by underlying network failures, such as when a router fault isolates a database, which may result in an application failure. Such problems can be very difficult to diagnose, especially automatically, because the network topology is not integrated with the processing and correlation of system-level events. Tivoli software has solved this problem by integrating the IBM Tivoli NetView® product (hereinafter referred to as the NetView product) with the IBM Tivoli Enterprise Console product to provide a single solution that provides both network management and event management capabilities. The NetView product is integrated with the IBM Tivoli Enterprise Console product in this release as follows:

- Predefined NetView event groups from are defined for IBM Tivoli Enterprise Console event consoles. This enables event console operators to receive, view, and act upon events sent from the NetView product immediately without administrator configuration. The NetView product events contain the prefix TEC_ITS_. The event groups are named Open NetView Events and Closed NetView Events. These event groups can be changed if necessary, and others can be added.
- Predefined NetView rules are defined in the IBM Tivoli Enterprise Console Default rule base. These rules do such processing as:
  - Correlate events related to subnets, applications, and servers, and network devices that are unreachable
  - Correlate network failures to system events
  - Correlate events associated with Router Fault Isolation
  - Process the up and down status of interfaces and nodes
- Enhanced root cause analysis by the NetView server (hereafter referred to as the network management server), only forwarding root cause events to the IBM Tivoli Enterprise Console event server (hereafter referred to as the event server) for processing.
- Enhanced communications between the event server and network management server so when a NetView event is acknowledged or closed at the event server, an SNMP trap is sent back to the network management server for synchronization and action if necessary (for example, a topology map may need to be updated).
- The ability to launch from the IBM Tivoli Enterprise Console Event Viewer (hereafter referred to as the Event Viewer) to an NetView console in the context of an event. That is, you can drill down with NetView tools to troubleshoot a network problem from an event in the Event Viewer. You can launch to the NetView Submap Explorer, Object Properties, or Diagnosis windows to view information about the problem node and take action if necessary.

To successfully use the NetView product launch features from the Event Viewer, certain prerequisite NetView product software must be installed and configured. You must also select an event in the Event Viewer to use the NetView product launch features.

For a complete list of NetView product features and how to use them, see the NetView product documentation library.

2. Launching a NetView Console from the Event Viewer

Note: For this feature to work successfully, certain prerequisite IBM Tivoli NetView, Version 7.1.2, software may need to be installed and configured. For additional information, see the README file for the FixPak.
This feature launches a NetView console in the context of an event selected in the Event Viewer. The **hostname** or **origin** attribute of the event determines which node to display in the NetView console.

To launch a NetView console from the Event Viewer:

1. Select the event in the Working Queue of the Event Viewer to provide the context.

2. Click **Selected > NetView** from the pull-down menu. (You can also use the Working Queue pop-up menu.)

3. Click one of the following items from the NetView submenu:

   - **Submap Explorer** to launch the NetView console with the Submap Explorer window showing.

   - **Object Properties** to launch the NetView console with the Object Properties window showing.

   - **Diagnostics** to launch the NetView console with the Diagnostics window showing.

4. If necessary, you are prompted for NetView console logon information.

See the NetView documentation for working with the NetView product.

3. NetView Console Logon Tips

The following tips may help you with the NetView console logon window:

- For events that originated from the NetView product (event class names prefixed with TEC_ITS_), the NetView server host name in the NetView console logon window is correct but the port number may not be. The port number is correct if you had previously connected to the specified server; otherwise, it defaults to 8080 and you may need to change it.

- For events of classes other than those originating from the NetView product, you must specify the host name and port number of the NetView server that contains information about the node specified in the event. Contact your NetView administrator for this information if necessary.

- The fields for host name and port number in the NetView console logon window contain pull-down lists of previous successful NetView server connection attempts, so you can quickly try to connect to numerous NetView servers. If you make unsuccessful attempts, that information is not added to the pull-down lists.

- If a NetView server connection attempt is unsuccessful and a message is issued stating the object was not found, you are prompted whether to launch another NetView console. If you click **Yes**, you must specify the NetView server host name and port number information. If you click **No**, you are returned to the Event Viewer.

- If there is a NetView console running that is connected to a server which contains the information about the node specified in an event, a new console is not launched; that is, an existing console is used whenever possible.

4. Synchronization and Correlation with the IBM Tivoli Netview Product

The IBM Tivoli NetView® product (hereafter referred to as the NetView product) monitors network resources and can generate IBM Tivoli Enterprise Console events about those resources. When the status of a network resource changes, the NetView product sends the IBM Tivoli Enterprise Console product an event notifying it of the change.

The IBM Tivoli Enterprise Console product provides a rule set, netview.rls, that helps manage these events generated by the NetView product. By closing obsolete or effect events, these rules ensure that only relevant events from the NetView product remain open in the IBM Tivoli Enterprise Console product. These rules also send information about status changes to these events back to the NetView product to keep information displayed there synchronized with information displayed on the event console. This chapter is an overview of these rules.

For the particulars of each rule, see the comments in the netview.rls file. For information about NetView events or NetView event handling, see the NetView documentation library.

This rule set is inactive by default. Before using the rule set, create the NetView event groups to enable a cleaner display of events. For more information about creating these event groups, see the FixPak README file and the `wcreatnvgroups` command.

This functionality is supported in IBM Tivoli Netview, version 7.1.2 and higher.

4.1. Events Sent From the IBM Tivoli Netview Product

The following table lists and briefly explains the events that are received from the NetView product.

Event	Description
TEC_ITS_INTERFACE_STATUS	The status associated with the network interface. Values are UP, DOWN, ADMIN_DOWN, and UNREACHABLE.
TEC_ITS_ISDN_STATUS	The status associated with the ISDN interface. Values are ACTIVE and DORMANT.
TEC_ITS_NODE_STATUS	The status associated with the network node. Values are UP, DOWN, MARGINAL, and UNREACHABLE.
TEC_ITS_SNMPCOLLECT_THRESHOLD	Reports threshold violations and threshold re-arms generated by the NetView SNMP collect daemon. Values are THRESHOLD_EXCEEDED, and REARMED.
TEC_ITS_SUBNET_CONNECTIVITY	The connectivity information associated with a subnet. Values are UNREACHABLE, and REACHABLEAGAIN.

Event	Description
TEC_ROUTER_STATUS	The status associated with the network router. Values are UP, DOWN, MARGINAL, and UNREACHABLE.

4.2. Synchronization with the IBM Tivoli Netview

Synchronization rules send the NetView product notification when an event that was originally received from the NetView product is closed or acknowledged in the IBM Tivoli Enterprise Console product. Therefore, the NetView display remains synchronized with the event console.

4.2.1. Synchronization of Acknowledged Events

When an event is acknowledged in the event console, that event is automatically acknowledged in the NetView product. The rules synchronize acknowledgements for the following events:

- TEC_ITS_INTERFACE_STATUS
- TEC_ITS_NODE_STATUS
- TEC_ITS_ROUTER_STATUS

To synchronize these events with the NetView product, these rules send SNMP traps back to the Netview product whenever these events are acknowledged. Upon receiving the SNMP trap, the NetView product updates the event to display it with an acknowledged status. That is, the NetView console displays the event as if a NetView operator acknowledged the event, even though it was acknowledged from the IBM Tivoli Enterprise Console product.

4.2.2. Synchronization of Closed Events

Typically, the NetView topology map is updated when objects in the topology map are polled for their status. These rules cause the following events that have been closed in the IBM Tivoli Enterprise Console product to immediately update their status at the NetView console:

- TEC_ITS_INTERFACE_STATUS
- TEC_ITS_NODE_STATUS
- TEC_ITS_ROUTER_STATUS

This is done by sending a SNMP trap to the NetView product which causes it to immediately poll the network object and then update the topology map accordingly.

For example, suppose an event console operator sees a TEC_ITS_NODE_STATUS event with a status of DOWN and sends someone to repair the device. When the repair is completed, the operator closes the event. The operator knows that the event was closed only after the device was fixed, and so expects the node's status to be updated in the NetView console to reflect this change. These rules cause that update to occur.

4.3. Clearing of NetView Events

When NetView resource status events are sent to the IBM Tivoli Enterprise Console product, old status events about the same resource become obsolete. When such a new event is received, old status events in the event cache for the same resource are automatically closed.

For example, if a router becomes unreachable, the NetView product sends a TEC_ITS_ROUTER_STATUS event with a status of DOWN. Later, when the router becomes available again, the NetView product sends another TEC_ITS_ROUTER_STATUS event, this time with a status of UP. In this instance, the rules would close the first TEC_ITS_ROUTER_STATUS event, because it is made obsolete by the second event. The events that are automatically closed are as follows:

- TEC_ITS_INTERFACE_STATUS
- TEC_ITS_ISDN_STATUS
- TEC_ITS_SNMPCOLLECT_THRESHOLD_STATUS
- TEC_ITS_NODE_STATUS
- TEC_ITS_ROUTER_STATUS
- TEC_ITS_SUBNET_CONNECTIVITY

4.4. Correlation with the IBM Tivoli Netview

When the availability of one network resource is affected by the availability of another resource, the event server might receive multiple events from the NetView product for one problem. These rules close events that are determined to be effect events and link them to the causal events. This way, an effect event need not be processed separately from its causal event. For more information about correlation and linking events, see the chapter on correlation examples in the *Tivoli Enterprise Console Rule Builder's Guide*, Version 3.7.

4.4.1. Correlation of Network Interface and Node Status Events

When network interfaces become unavailable, they can cause nodes or routers to fail. When this happens, the event server might receive events for both the interface failure and the node or router failure. Because this is really one problem, not two, the interface failure event is set as a causal event and the node or router failure events are closed, because they are effect events.

The following events are effect events of a TEC_INTERFACE_STATUS event with a status of DOWN or UNREACHABLE:

- TEC_ITS_NODE_STATUS event with a status of DOWN or MARGINAL.
- TEC_ITS_ROUTER_STATUS event with a status of DOWN or MARGINAL

For example, as all of a router's interfaces become unavailable over a period of time, the NetView product forwards a TEC_ITS_INTERFACE_STATUS event with a status of DOWN for each interface as it becomes unavailable. Once all of the router's interfaces are unavailable, this means that the router is unavailable. Therefore, the NetView product also forwards a TEC_ITS_ROUTER_STATUS event with a status of DOWN. When the event server receives the router-down event, and the TEC_ITS_INTERFACE_STATUS event is still in the event cache, the TEC_ITS_INTERFACE_STATUS event is linked as a causal event of the TEC_ITS_ROUTER_STATUS event. The TEC_ITS_ROUTER_EVENT event is then

automatically closed. This enables automatic processing to determine the root cause of the event and avoids treating the router and interface events as multiple problems.

4.4.2. Correlation of Subnet and Router Status Events

When routers become unreachable, the event server receives events for both the subnet being unreachable and the router failure. In the event of multiple events for subnet and router failure, these rules set the router event as the causal event and close the subnet event. That is, these rules link each TEC_ITS_ROUTER_STATUS event with status DOWN or MARGINAL as a causal event of TEC_ITS_SUBNET_CONNECTIVITY events with status UNREACHABLE.

These rules correlate all subnet unreachable events from the same NetView server to all TEC_ITS_ROUTER_STATUS events with status DOWN or MARGINAL from the same NetView server. To obtain further information about the cause of the problem, launch the NetView console.

For example, suppose that the NetView product detects a router failure while monitoring a subnet and sends a TEC_ITS_ROUTER_STATUS event to the event server. Because a router is unavailable, the status of the subnet becomes UNREACHABLE. Therefore, the NetView product forwards a TEC_ITS_SUBNET_CONNECTIVITY event to the event server with a status of UNREACHABLE. When the correlation rules are evaluated, the TEC_ITS_SUBNET_CONNECTIVITY event is then closed and the router event is linked to the subnet event as its causal event.

4.5. Correlation of Non-Network Events and Network Events

The netview.rls rule set correlates subnet status information from the NetView product with information from other applications monitoring network resources. If an event reporting that a resource is unavailable arrives after the NetView product reports that a subnet is unavailable, the subnet event is designated as the causal event, and the resource event is closed as the effect event.

For an event to be correlated with a TEC_ITS_SUBNET_CONNECTIVITY event, the event must be a subclass of a TEC_ITS_UNREACHABLE event and must contain the IP address of the failed network resource in the ip_unreachable attribute of the event.

5. wcrtnvgroups

Creates event groups required to use the netview.rls rule set.

Syntax

wcrtnvgroups [-h *host*] [-u *user*] [-p *password*]

Description

The **wcrtnvgroups** script uses the wconsole command to create the Tivoli Netview event groups required by the netview.rls rule set. These two groups are the OpenNetview event group and the ClosedNetview event group. The OpenNetview event group contains events from the Tivoli Netview product that are open in the IBM Tivoli Enterprise Console product. The OtherNetview event group contains the events from the Tivoli Netview product that have a status other than OPEN in the IBM Tivoli Enterprise Console product.

If you do not specify the -h, -u, and -p options, a dialog box is displayed to enter the information when the **wcrtnvgroups** command is executed. Your environment must be properly configured to allow such a display. If it is not possible to configure your environment to display a dialog box, you must use the -h, -u, and -p options instead.

Authorization

user

Options

-h *host* Specifies the hostname where the event console runs.

-u *user* Specifies the user name of the administrator.

-p *password*
　　　Specifies the password of the administrator.

Examples

The following creates the event groups on a machine called phizer:

```
wcrtnvgroups phizer.dev.tivoli.com jford my_password
```

See Also

wconsole