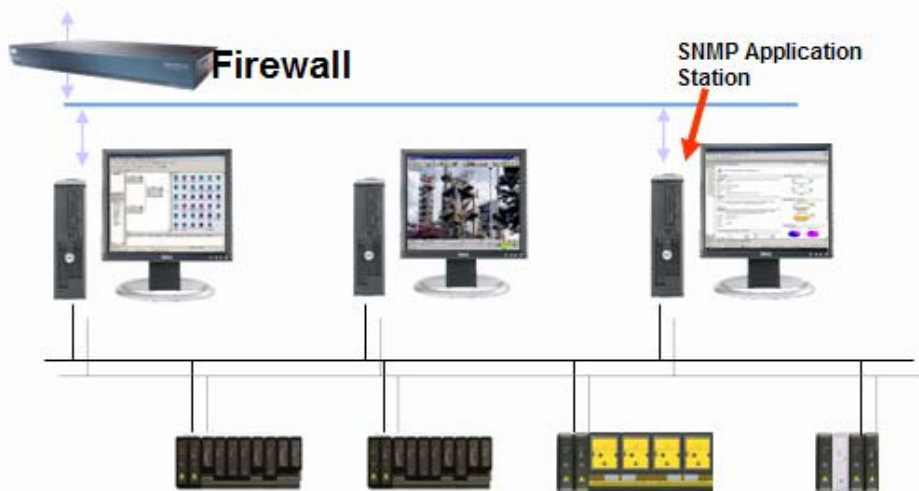




Using SNMP on a DeltaV System

Using a Simple Network Management Protocol (SNMP) application is not “simple” and its proper and safe use in a live network requires some expertise. The purpose of this paper is to provide information supporting that expertise.



The SNMP application is installed on a DeltaV Application station and any external SNMP data access must be secured through the firewall

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Introduction

Simple Network Management Protocol (SNMP) is a communications protocol that enables a widely used method for monitoring and managing TCP/IP networks and network devices.

As a standard part of the DeltaV digital automation system, DeltaV Diagnostics provides information and status alerts concerning the DeltaV control network and devices in a user-friendly, easy-to-use implementation such that the use of SNMP reporting is not required on a DeltaV network.

Requests for SNMP

In some DeltaV system implementations (typically very large systems and/or systems that are spread over a large geographical area), some users have requested that DeltaV permit the use of SNMP monitoring to supplement the DeltaV diagnostic information to monitor and troubleshoot the control network.

Emerson's Response

As part of DeltaV v9.3 development, we have done the following test of SNMP data collection:

- The v9.3 DeltaV MD controller supports SNMP reporting.
- Installed a popular, off the shelf SNMP monitoring application (Whatsup Professional 2006 –from Ipswitch, Inc.) on a DeltaV application station.
- Using the standard features of the Whatsup application, we have set up a basic SNMP monitoring station to collect the information available in the SNMP-enabled devices.
- Set up the SNMP traps in the network devices to collect any standard trap information coming from these devices.
- Left this setup enabled during v9.3 product testing to determine whether there is any adverse impact on DeltaV due to SNMP communications.
- Performed a limited set of system analysis and troubleshooting activities to exercise the application in a user role.

What We Discovered

In this basic SNMP data collection configuration we discovered no negative impact on the performance of the DeltaV system due to the added communications load from the SNMP data collection.

The Whatsup application must be installed on an Application Station dedicated to this activity with no other DeltaV application running on the workstation. During network analysis and troubleshooting activities, the application consumed a lot of computer CPU resources.

Conclusion: Using SNMP on the DeltaV System

Based on the testing performed during DeltaV v9.3 development we feel that the use of SNMP data collection on a DeltaV network can be permitted under the following conditions:

- SNMP is a supplement to using DeltaV Diagnostics. The primary diagnostic tool is the standard DeltaV Diagnostics application.



- SNMP data collection must be set up such that it does not create more than a 1% increase in the base load to the DeltaV communications traffic. Users are responsible for monitoring and managing the communications performance.
- During DeltaV network troubleshooting, the SNMP data collection can be disabled as part of any diagnostic activities required.
- For extended use of SNMP in the DeltaV system, implementation services from Emerson Process Management are required.

If You Plan to Use SNMP in the DeltaV System Please Read Further...

“Simple” Isn’t

SNMP stands for “Simple Network Management Protocol.” However, “simple” is a relative term comparing this protocol with other protocols that could be used. It describes the communications protocol and not the complexity of the SNMP application itself.

As with most applications, using an SNMP application is not “simple,” and the proper and safe use in a live network requires some expertise on the part of the user.

If you plan to use SNMP with the DeltaV system and are not already familiar and comfortable in using SNMP, we suggest that you proceed with caution. Consider setting up the application on an operator training system, if one is available. Or, if you must use the live DeltaV system, start by manually configuring the IP addresses of a few nodes to be monitored and use these few nodes to understand how the application works and what data is available from the nodes. We suggest that you be careful when using auto discovery or Smart Scan on a live DeltaV system. While we have found no problem in using these tools on the test system, there is always a chance that auto discovery/scanning could cause issues on a system running in the field.

Device Monitor, not Management

SNMP applications must be set up to monitor devices. We do not recommend allowing the SNMP application to manage the devices. Only the public information should be monitored from the devices. For device management the applications provided by the manufacturer (such as Cisco) should be used for management.

Basic MIB Information and Traps

When enabling SNMP reporting on the network switches and workstations, only the basic management information bases (MIB) information and default SNMP traps should be enabled. Device-specific MIBs and traps should not be configured. If you desire to use any manufacturer-specific MIBs, we suggest you consult with Emerson Process Management prior to using these features.

The basic MIBs will provide information concerning the network interface and other device information that can be collected depending on what information is exposed via SNMP by the device. The illustrations in this document show the information exposed by the workstations and controllers.

Note that the controllers provide SNMP information only on the network interface. For detailed controller performance information DeltaV Diagnostics should be used. SNMP was enabled in the controller primarily so the devices can participate in an auto discovery process as part of developing an SNMP-generated network diagram.



Running optional agents on the workstation (such as Dell Open manage) to populate vendor-specific MIB information is not supported on DeltaV workstations at this time.

SNMP Information Access

DeltaV requires that all SNMP communications be done locally on the DeltaV network. Under no circumstances should native SNMP protocol be used to communicate external to DeltaV. Network interface devices such as firewalls must be set up to block any and all SNMP-based communications external to DeltaV. The SNMP management application has capabilities to communicate information to other workstations on the DeltaV system or to external devices such as pagers. For help in communicating SNMP information to other nodes or outside of the DeltaV system, please consult with Emerson Process Management for assistance.

Support for SNMP on the DeltaV System

Testing of basic SNMP data collection has been done to aid users who have the need and experience to use an SNMP application with the DeltaV system. We have extremely limited experience with the Whatsup Professional application and are able to provide support for this application only through a paid service. The Emerson Global Service Center personnel also do not have experience with SNMP and are not a source of support. Also note that it is possible that, when troubleshooting any DeltaV network issues, it may be necessary to disable SNMP data collection during the troubleshooting process.



Properties

Display name: 10.4.0.138
Device type: Server
Host name: 10.4.0.138
Address: 10.4.0.138
Notes: Added from Discovery on Thu Oct 12 10:07:36 2006

Attributes

Contact: DeltaV Administrator
Description: DeltaV - MD Software: 9.3.0.5158.xr Hardware: 5.2
Location: Austin, Texas

SNMP Details

Description: DeltaV - MD Software: 9.3.0.5186.xr Hardware: 5.2
Object ID: 1.3.6.1.4.1.12.7.1.3.0
Up time: 5days 06:04:52.00
Contact: DeltaV Administrator
Name: CTRLR12
Location: Austin, Texas

Response time and Packet loss - Last 4 Hours

10.4.0.138

Response Time (ms) Current: 2ms

% Packet Loss Current: 0%

Interface Utilization - Last 4 Hours

Description	Receive	Transmit	Max
DeltaV Primary ACN	0.15 %	0.18 %	0.18 %
DeltaV Secondary ACN	0.02 %	0.02 %	0.02 %

Figure 1 Device information display showing the information available from the controller MIB

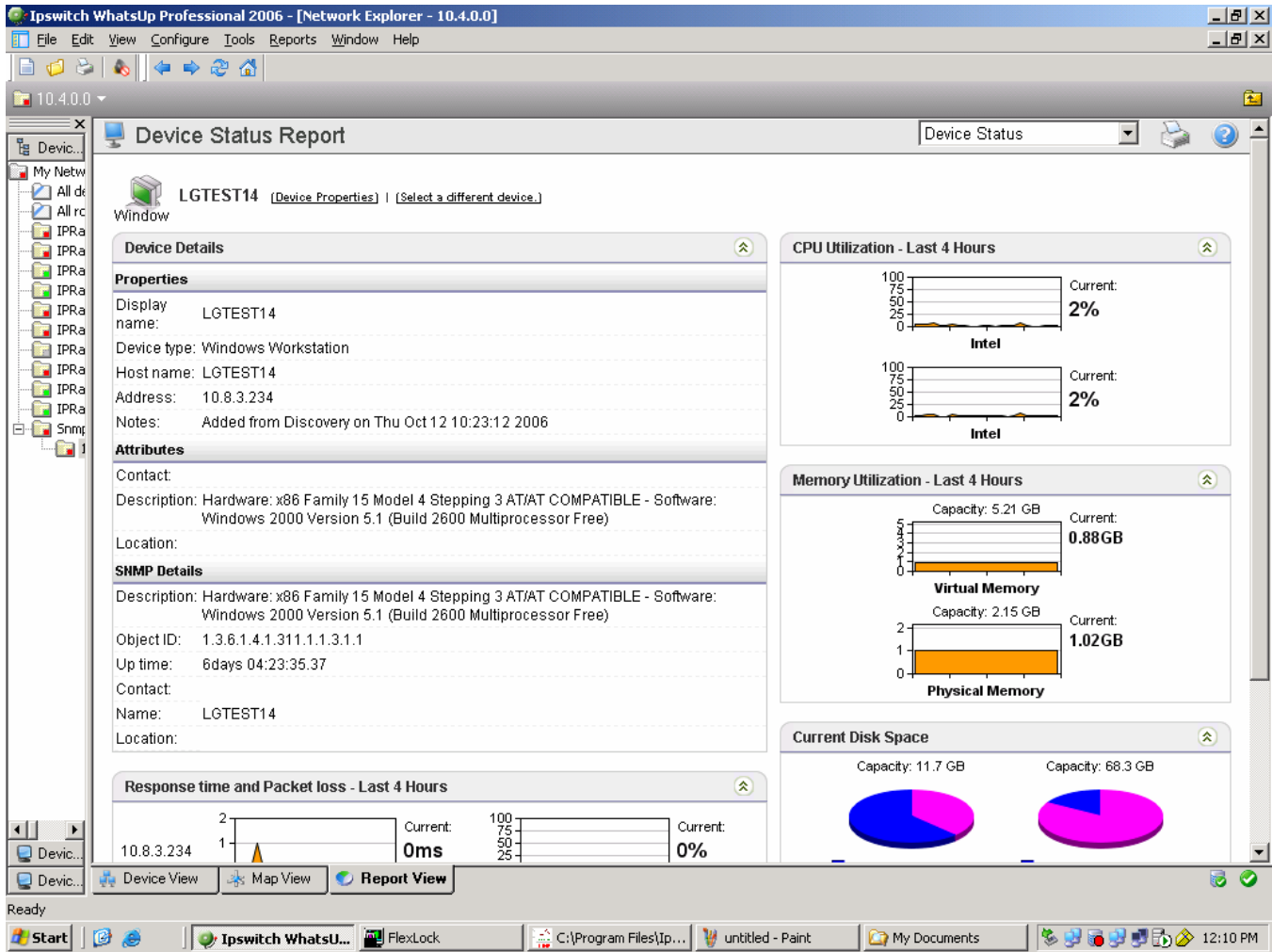


Figure 2 - Workstation device status showing the information available from the basic MIB



Ordering Information

VE number	Description
None	The Whatsup Professional software must be purchased from others. Either Whatsup Professional 2006 Premium or Standard edition may be used.

Ordering Information details

The Whatsup Professional software package can be purchased on the Web from vendors such as www.cdw.com. A Google search of “Whatsup Professional” provides a list of many vendors from whom the software can be obtained.

Language Support

Please consult with Ipswitch (www.ipswitch.com) to determine whether the software is available for your language version of the DeltaV software.

DeltaV Operate for PROVOX and DeltaV Operate for RS3 support

SNMP monitoring can be done on any DeltaV system.

Performance

The use of basic SNMP data gathering/monitoring does not add sufficient network loading to impact the performance of the DeltaV network communications.

Other information

Assistance for configuring an SNMP application and using SNMP within a DeltaV system can be obtained as a service from SureService or as part of a project implementation from an Emerson industry center (EIC). The services organization at the Hydrocarbon and Energy Industry Center (HEIC) in Calgary has experience in using SNMP within the DeltaV system and may be contracted for this service.

Prerequisites

SNMP data collection and Whatsup Professional have been tested using DeltaV version 9.3.

This capability is not included on the DeltaV CD, and the software must be ordered separately.

The DeltaV Application Station base license is required if the software is installed on a DeltaV Application Station. Additional DeltaV licenses are not required.

The Whatsup Professional software has been tested and can be installed on base DeltaV Application Station software only. Use of the application is allowed only if used on a workstation dedicated to SNMP activities.

Whatsup Professional must be used in the monitor mode only. DeltaV does not support or recommend using an SNMP application to manage any network devices (including workstations) on the DeltaV network. All device management should be done by the vendor-supplied applications used for this purpose.