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Network devices in traffic signal applications, toll booth applications and Intelligent Transportation System (ITS) applications have one thing in common: when they crash or fail, it's imperative that they be restored to running condition as quickly as possible. The reason for this is obvious; when a network device in a traffic or transportation related application fails to respond, that failure can result in traffic tie-ups, lost toll booth revenue and temporarily useless monitoring and alert systems until the problem is corrected.

WTI's NPS-3F15 series Network Power Switches provide traffic system administrators with a secure, reliable means to control reboot and power switching functions at remote network equipment sites without the need to travel to the site in person. When the NPS-3F15 is installed in a roadside VMS control enclosure, toll booth or signal control box, administrators can communicate with the unit via primary network or out-of-band connection and immediately initiate power reboots or power On/Off switching in order to restart troublesome network elements or take unresponsive units off-line.

This article will discuss three common transportation/traffic related applications that include remote reboot capabilities provided by the NPS-3F15 and will also discuss a solution for managing and maintaining multiple WTI units spread throughout a large Intelligent Transportation System network:

➤ **Managing Network Devices in Traffic Signal Control Enclosures**

➤ **Managing Network Devices in Toll Booth Applications**

➤ **Managing Network Devices in Intelligent Transportation System (ITS) Applications**

➤ **Managing Multiple WTI Units Using the WTI Management Utility**

In addition to allowing fast, secure access to remote reboot capabilities, the NPS-3F15 also includes monitoring and alarm functions to help administrators keep track of conditions and events at distant traffic/transportation control enclosures. When properly configured and enabled, the NPS-3F15 can automatically notify administrators via email, SNMP trap, SYSLOG or text message when high temperatures, unresponsive devices, excessive invalid access attempts, power supply instability or other potentially critical conditions develop at remote network equipment enclosures. In order to document important events at traffic/transportation control enclosures, the NPS-3F15 can also create a log of user activity and alarm actions for later review. Logged data can be downloaded in plain text or XML format.

The compact, full featured NPS-3F15 provides an ideal solution for managing network devices located in cramped roadside equipment enclosures or other environments where rack space is scarce. In order to ensure that power reboot and switching functions are safely protected from unauthorized access, the NPS-3F15 features a formidable assortment of security and authentication features. A password directory allows administrators to define passwords and access privileges for up to 128 unique users. The NPS-3F15 also supports popular authentication protocols such as TACACS+, Kerberos, LDAP and Radius to verify the identity of each potential user at login. In order to ensure that communication with the NPS-3F15 is secure and private, the unit also supports HTTPS/SSL secure web and SSHv2 and encryption and includes an embedded, validated FIPS 140-2 cryptographic module.

Managing Network Devices in Traffic Signal Control Enclosures

Traffic signal control enclosures include a variety of electronic devices that can often be restored to normal operation by a simple power reboot. In addition to an Ethernet switch, street corner signal control boxes can also include sensor controls, devices for managing inductive loop detectors, signal sequencing equipment and traffic cameras. When any of these elements crash or fail, the result can be traffic tie-ups, safety problems and impatient drivers.
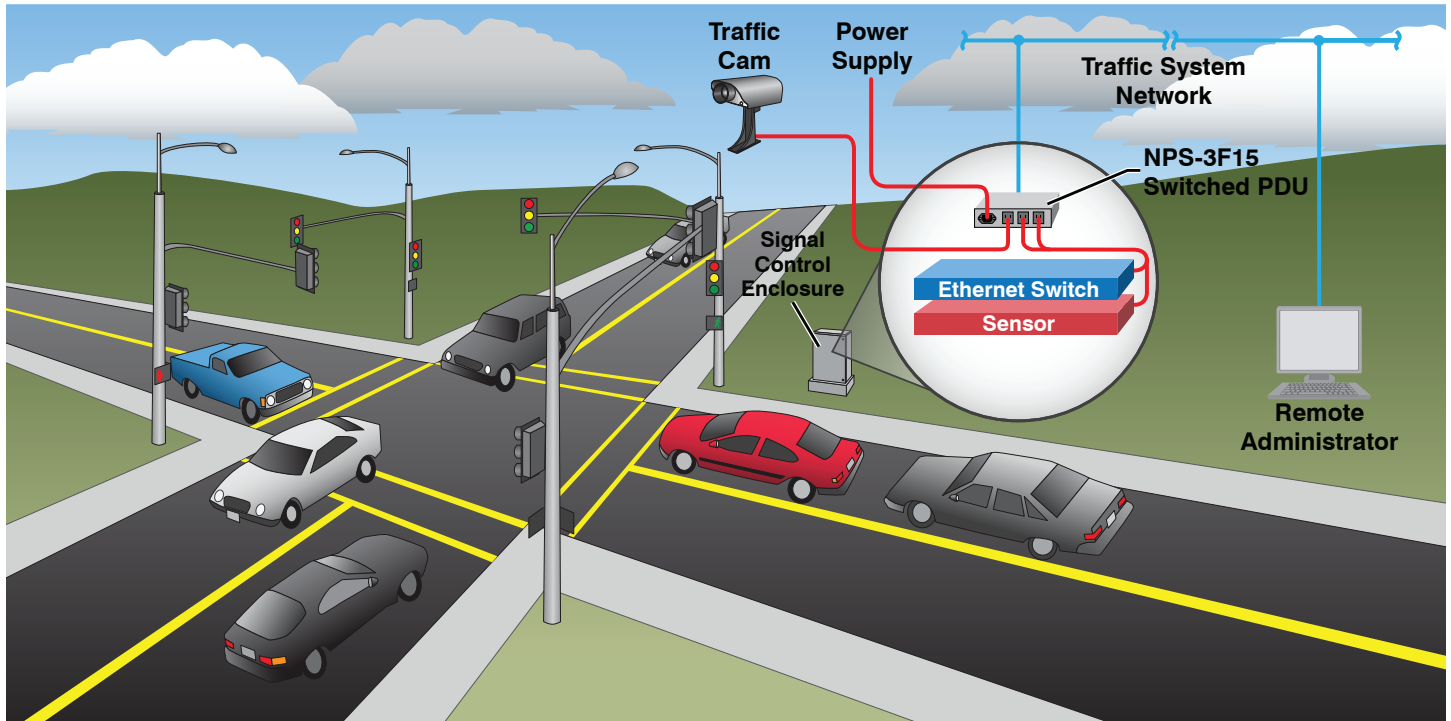

The entire purpose of a traffic system is to keep traffic moving smoothly, and when a network element in a traffic signal control enclosure ceases to operate and causes a major traffic back-up, it's absolutely imperative that remote administrators have a way to correct the problem as quickly as possible. In situations like this, there's no time to wait for a service team to arrive on-site; the problem needs to be dealt with immediately (if not sooner.)

WTI NPS-3F15 series Network Power Switches provide traffic system managers with a secure, reliable means to reboot devices in remote roadside enclosures in order to restore traffic signal systems to normal operation and get traffic moving again. When an NPS-3F15 Network Power Switch is installed in a street corner signal control box, system administrators can immediately contact the NPS via in-band or out-of-band connection and invoke commands to reboot unresponsive devices in a fraction of the time that would be required for a service team to arrive on site.

Managing Network Devices in Toll Booth Applications

Toll booths are another example of a traffic/transportation related application that can benefit from the remote reboot and power control capabilities provided by the NPS-3F15 Network Power Switch. As is the case with other transportation related applications, problems with networked devices in Toll Booths can also result in traffic tie-ups and delays. But in Toll Booth applications, there's also an economic factor involved: malfunctioning devices in Toll Booths and Kiosks can create a situation where toll fees cannot be collected and driver information cannot be captured.
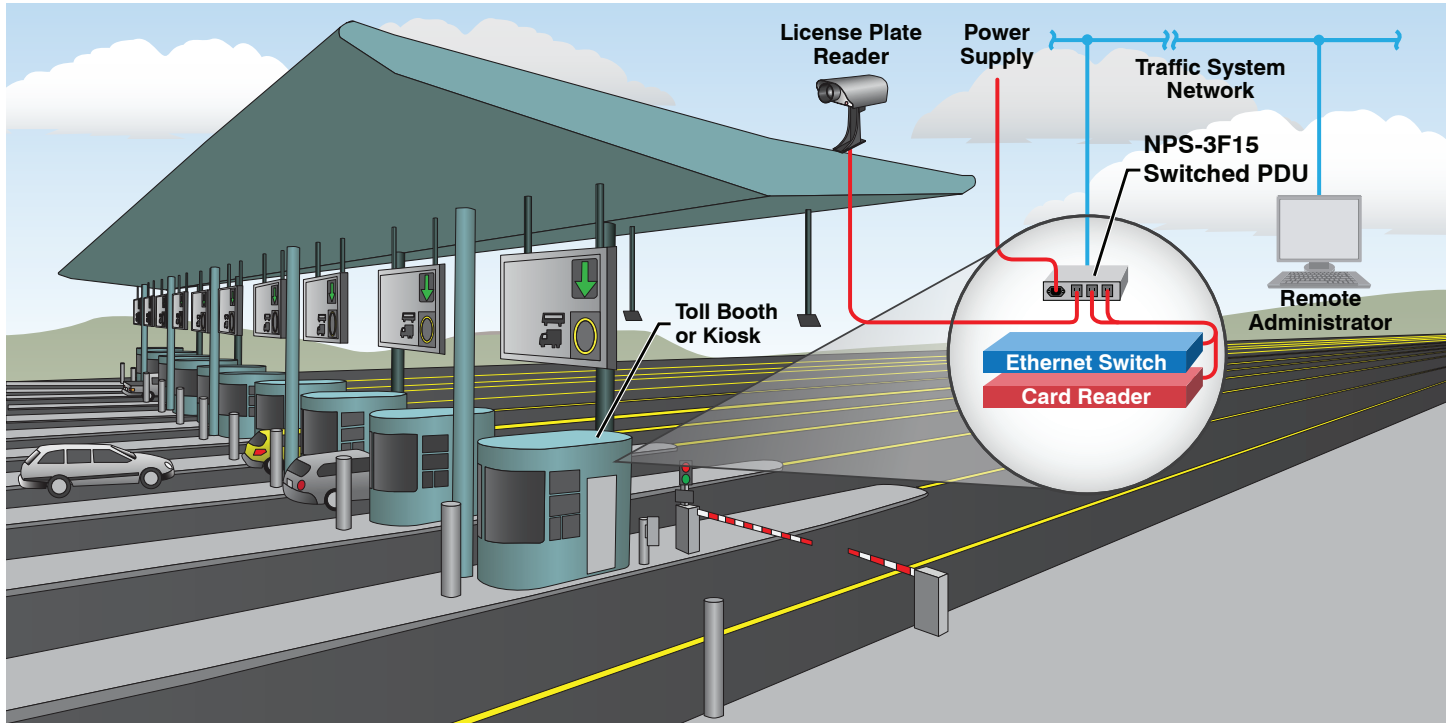

In Toll Booth applications, the NPS-3F15 Network Power Switch is often used to provide a means to remotely reboot devices such as card scanners, tag readers, toll collection systems, license plate capture cameras and other networked devices. When any of these devices fail, remote administrators can immediately establish a secure connection to the NPS unit and then initiate power reboot operations to restart nonresponsive devices and restore normal operation.

The NPS-3F15 works equally well in both manned Toll Booth applications and unmanned Toll Kiosk applications, but the end result in both cases is the same: faster resolution of problems at the remote site and reduced downtime. The NPS provides remote administrators with an effective, secure means to reboot unresponsive devices at distant Toll Booths or Toll Kiosks to bring networked services back on line, ensuring that tolls can be collected and traffic continues to move freely.

Managing Network Devices in Intelligent Transportation System (ITS) Applications

Intelligent Transportation Systems (ITS) provide two valuable services: they keep drivers informed regarding conditions on the road ahead and help to track traffic congestion levels across huge freeway networks. Given the size and scope of most Intelligent Transportation Systems, it's absolutely vital to allow the capability to remotely manage networked traffic monitoring and reporting devices spread throughout the system.
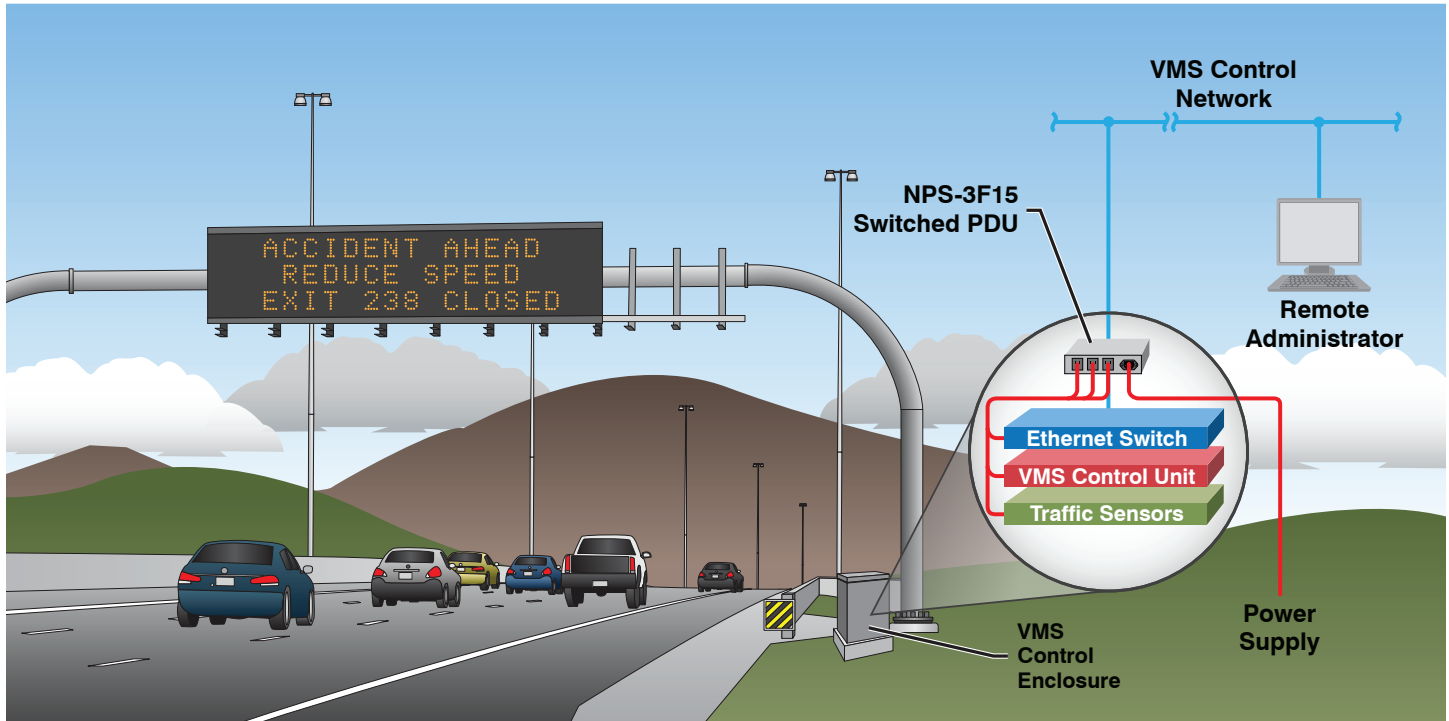

In a large metropolitan area, a typical control enclosure in an Intelligent Transportation System might include an Ethernet switch to allow network connectivity, inductive loop detection systems to measure traffic levels, traffic cameras to monitor conditions on various roadways and controls for Variable Message Signs (VMS) to notify drivers of travel times, closed roadways and accidents along the route. Without these critical capabilities, ITS managers are unable to effectively monitor traffic levels or react to unexpected problems in a timely manner.

In ITS applications, the NPS-3F15 allows system administrators to quickly reboot unresponsive networked devices in order to restore traffic monitoring and VMS capabilities or switch devices On or Off depending on need, time of day and other factors. This eliminates the need for service calls to remote roadside control enclosures, and allows immediate response to changing conditions and service outages.

Managing Multiple WTI Units Using the WTI Management Utility

In large scale network applications such as Intelligent Traffic Systems, administrators are regularly faced with the task of updating dozens of identical units located at a multitude of distant installation sites, spread throughout the network. Updating firmware or changing a user password is a relatively simple proposition when only a few devices are concerned, but in a network that includes dozens, hundreds or even thousands of identical units, even these simple tasks can quickly grow into monumental challenges.
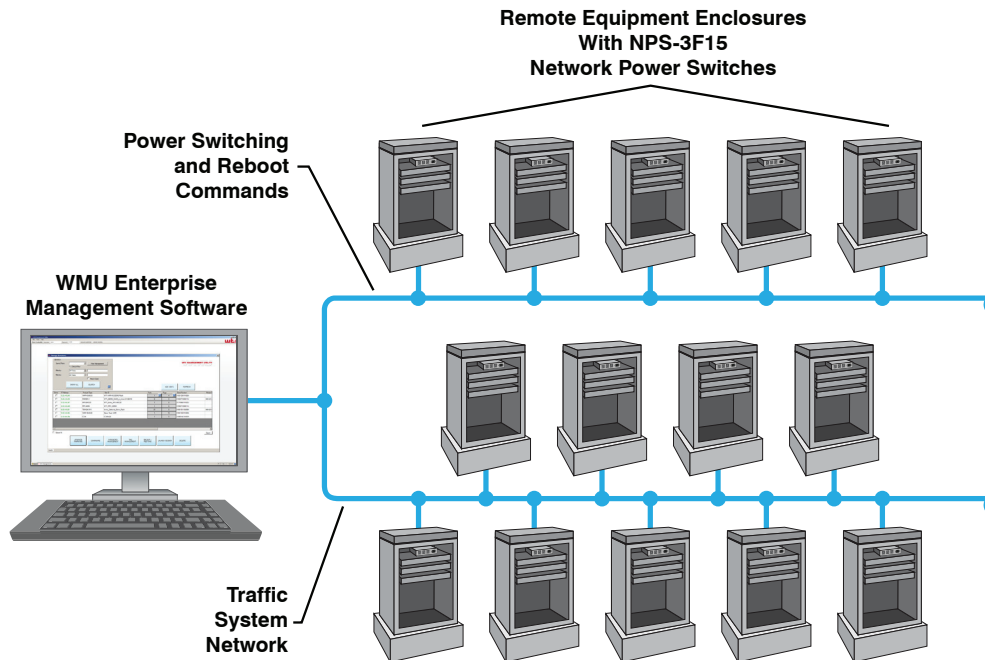
WTI's WMU management utility helps to streamline routine maintenance tasks by providing a single interface that administrators can employ to manage all WTI devices within a large, far-flung Intelligent Transportation System. Rather than tediously accessing each individual unit within the network, the WMU enables administrators to address multiple units from a single, centralized interface.

The WMU allows administrators to identify each WTI unit on the network, organize WTI units into groups based on location or functionality and execute power switching and reboot commands at individual or multiple NPS-3F15 units. In addition to providing a single interface to control multiple remote power switching units, the WMU also enables administrators to perform firmware updates and manage passwords for multiple or individual WTI units.

As networks of roads, highways and transportation systems continue to grow and become more crowded, dependence upon networked devices to help manage these roads and highways and control the flow of traffic will also continue to grow. In order to meet the management and maintenance needs of large, far-flung, Intelligent Transportation Systems it has become increasingly important to include a remote management solution for dealing with problems at the hundreds of roadside control boxes located along the roads and highways.

WTI's NPS-3F15 series Network Power Managers provide a compact, effective, reliable means to remotely reboot devices in roadside control enclosures in order to restore unresponsive traffic control, monitoring and notification systems to normal operation. An efficient remote power management solution that includes the NPS-3F15 enables system managers to deal with problems with networked devices within the Intelligent Traffic System immediately, without the delays and expenses associated with traditional physical service calls.