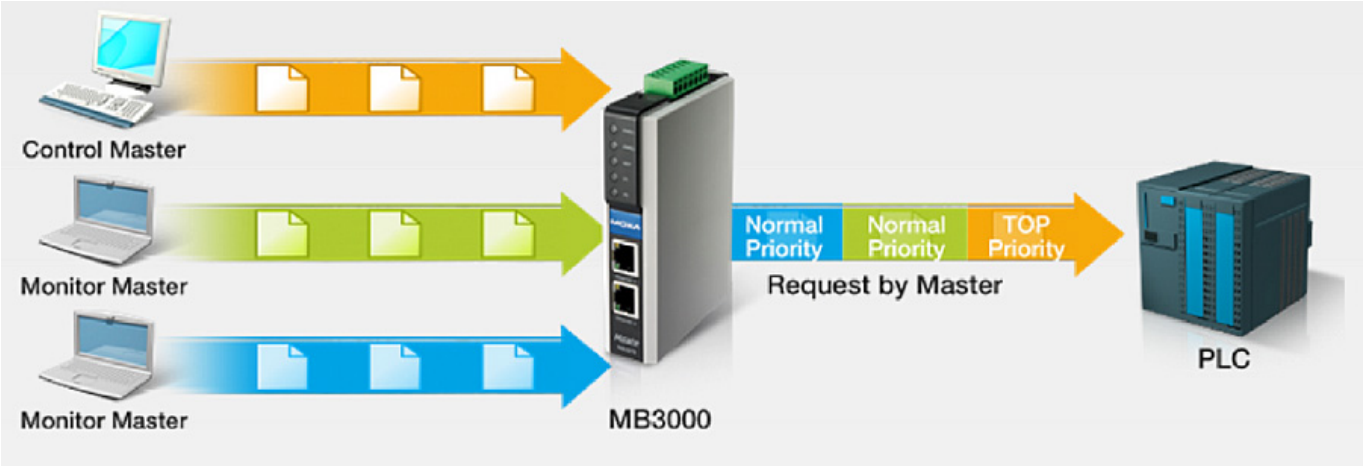
IEC 61850 Subtations Retrofits Operation

How can I optimize, perform daily maintenance on, and troubleshoot an established system?



Common Challenges of Retrofit Substations

Challenge

How can I optimize, perform daily maintenance on, and troubleshoot an established system?

Major Concerns

Challenge 1: How to find Modbus communication errors
Challenge 2: How to prioritize Modbus RTU messages
Challenge 3: How to achieve high performance and protect my applications

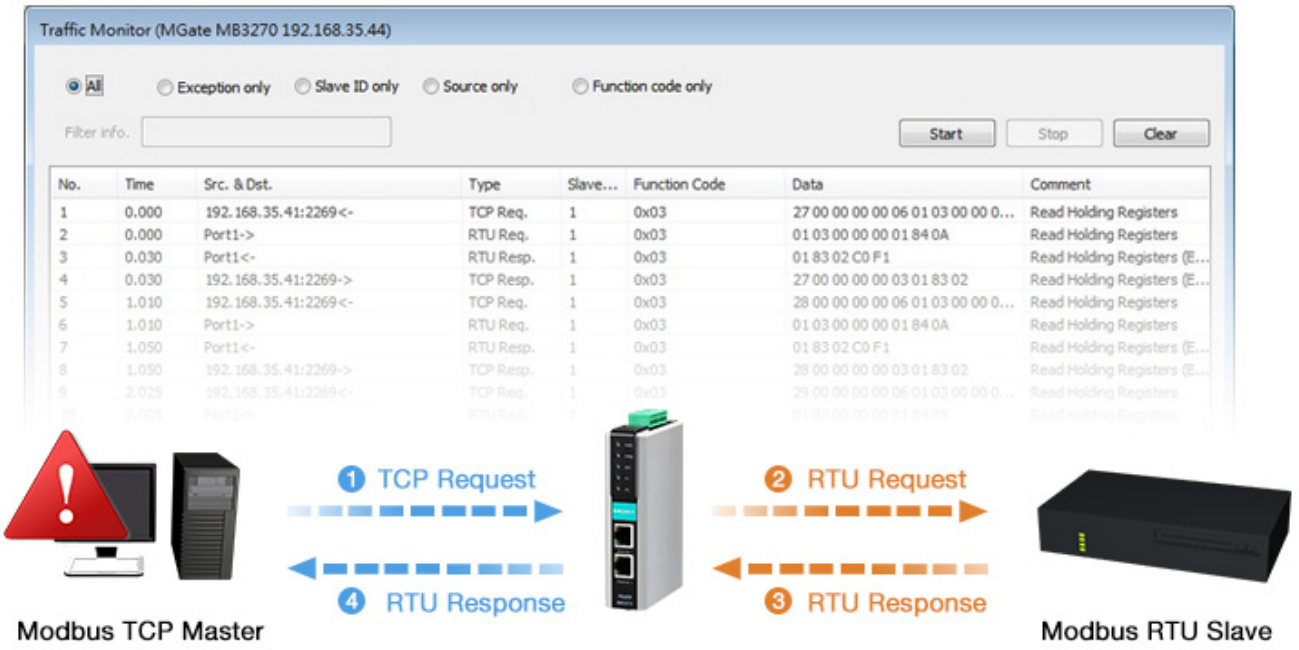
Solution

Modbus Traffic Monitoring

Moxa?s MGate gateways feature a built-in protocol analyzer to record all commands and responses that pass through the gateway, assisting users in determining the root cause of network failures. When a connection fails, it can be hard to find the root cause without knowing what happened before the failure. But now you can refer to the protocol analyzer log to find out why the gateway didn?t receive the response from the Modbus RTU slave.

- **Users can easily find the root cause of communication errors**

- **The log can be exported to**
  Ask help from technical service
  Track dedicated data for further analysis (in Excel format)

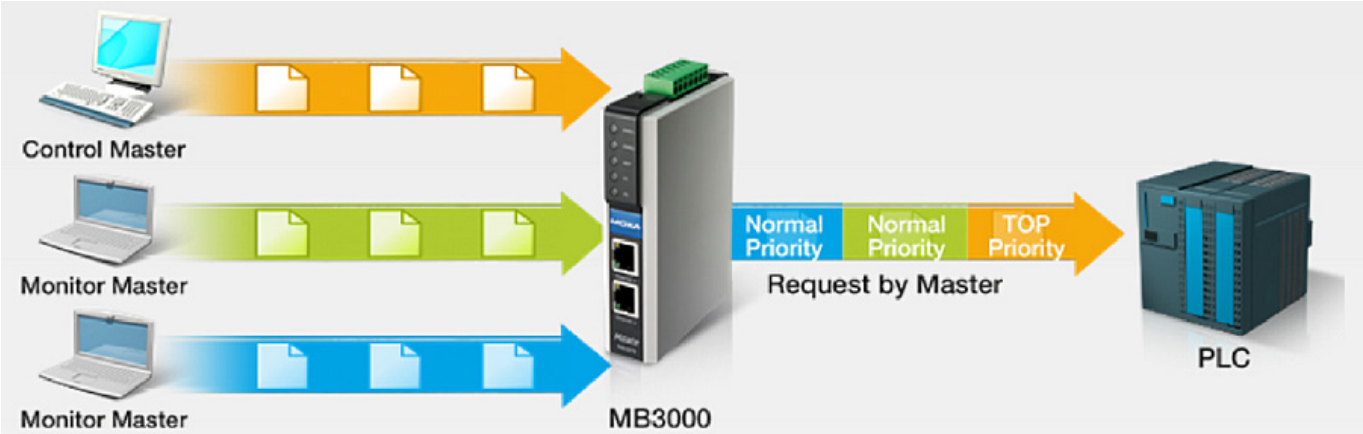


Patented Modus RTU Message Priority Control

As Modbus networks increase in size and complexity, the lag time between commands and responses becomes a major concern. Advanced models of the MB3000 series provide a priority control function for urgent commands, allowing users to force certain commands to get an immediate response. Depending on your system?s requirements, different methods are available to define which commands receive priority for emergency requests.

- To track important figures without delay and trigger system alarm

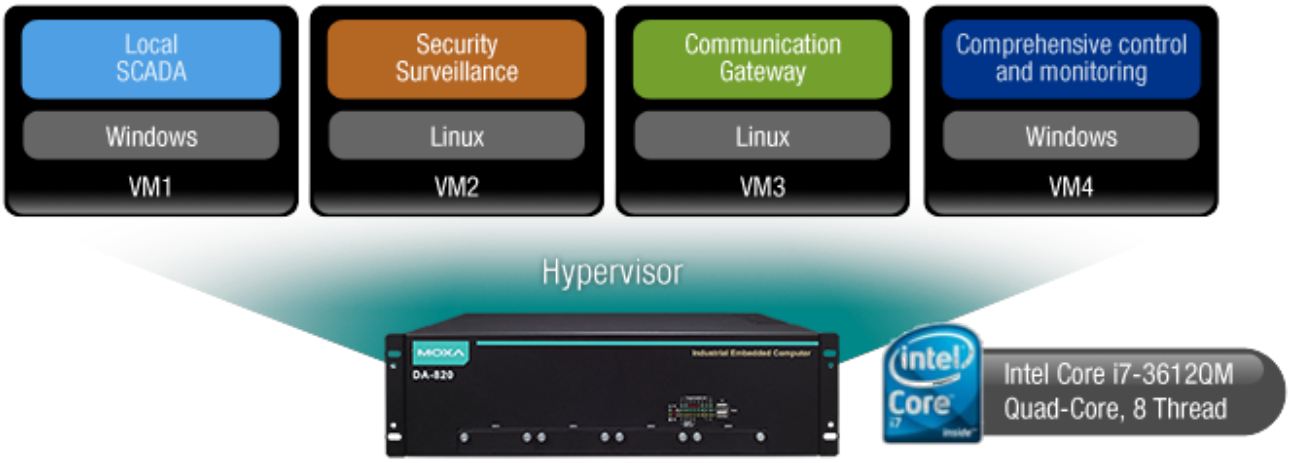
notifications
- Can be defined by IP address, TCP port, or request type



Comprehensive Control and Monitoring with SCADA Virtualization

A Virtual Application Platform that Can Play Multiple Roles

The multi-function, high performance DA-820 computers are suitable for multi-function tasks. In substations, this means handling remote control and monitoring, front-end communication, backend hosting, tele-control, and video surveillance. In order to confirm its ability to support multiple tasks at the same time, the DA-820 was successfully tested with VMware ESXi. Simply install VMware on the high performance and full-function DA-820 computer to support and switch between different operating systems for different applications.



OS Smart Recovery: Remotely or Automatically Trigger a Computer to Restore its Entire Software Environment

Moxa Smart Recovery? allows engineers to automate remote monitoring of a computer?s health and to trigger OS re-writes when problems arise. These re-writes are made from a tagged copy of the entire system that is stored locally on the computer, created when the embedded computer was first successfully deployed.

Without a smart OS recovery system, corruption of system software?whether in the OS or in local substation applications?can mean catastrophic failure for remote industrial installations and sites with mass computer deployments. With some estimates of computer failure attributable to software corruption as high as 30%, automated BIOS-level software recovery systems are an extremely valuable design addition to power substation installations.

- **One-click OS image generation tool**

- **Automatic or one-click Moxa smart recovery tool**

- **Power Shutdown:**
  Auto boot up
- **System slowdowns:**
  Configure periodical recoveries to speed things up

- **Bootable but damaged systems:**
  Configure a rewrite procedure that will let you know if the damage is in the hardware or software

- **System crash and boot failure:**
  Use auto-recovery to verify if the problem is with the hardware or software, and resurrect the machine if it?s a software problem