



Platform Services

Debugging BACnet Communication



APPLICATION NOTE

September 2013

Description: Guide to troubleshooting and debugging BACnet communication.

OS Requirement: Windows 8 x64 (Professional or Enterprise Edition) / Windows 7 x64 (Professional or Enterprise Edition) / Windows Server 2012 x64 / Windows Server 2008 R2 x64 / Windows Vista x64 SP2 (Business, Ultimate, or Enterprise Edition) / Windows Server 2008 x64

General Requirement: GENESIS64-family product v10.8 and later, basic knowledge about BACnet and computer networking

Introduction

When you observe any unexpected/suspicious behavior with BACnet in ICONICS' GENESIS64, please make sure that the problem is not caused by the device itself before you contact ICONICS' support. To find this out, you can trace communication between the device and GENESIS64's BACnet Runtime using a free tool: Wireshark. It can be downloaded at <http://www.wireshark.org/>. Using this tool, you can collect packets sent by the device and BACnet Runtime. This is always needed in case we need to investigate any problem regarding BACnet.

BACnet Protocol

For detailed review of captured BACnet data is required extended knowledge of BACnet protocol. For quick overlook you should know at least BACnet protocol basics:

Very basic service is **Who-Is** request followed by **I-am** replies: They're used by BACnet devices (especially GENESIS64 as BACnet Workstation acting as client to remote BACnet devices) to get information about available BACnet devices in the network.

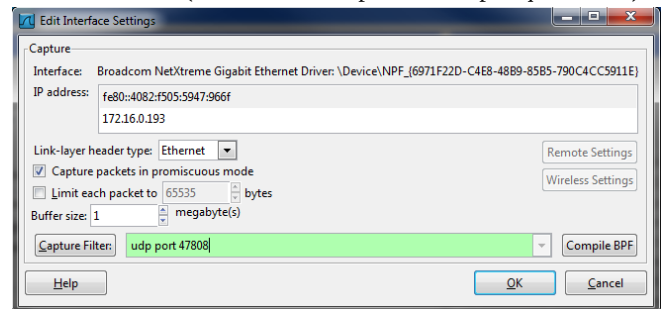
You should also know about **ReadProperty** and **ReadPropertyMultiple** requests and replies (acknowledgements): These are basic BACnet services to retrieve property values and have to be replied always (even if reply can say that request is invalid, e.g. due to the non-existing requested object instance or property).

Firewall configuration & IP Routing

The first thing you should try before further troubleshooting is to make sure the way between the BACnet device and GENESIS64 is fully opened for BACnet packets. BACnet goes through UDP protocol and, by default, it uses port **47808**. Also make sure that routing between different IP Network segments is properly set, so that packets are properly forwarded from one network segment to another if needed.

Capturing BACnet Communication

1. Before starting the Capture process, set up the Capture Filter to '**udp port 47808**' to filter out any other network communication (Remote Desktop, DNS, http requests, etc):



2. Start packet capturing.
3. Do the steps leading to reproduction of a problem.
4. Review the log and see if the device sends the packets you expect. If not, then the problem is in the device (or directly in device's configuration). If you can see expected packets, then the problem is very probably somewhere in GENESIS64. In such cases, enable TraceWorX for 'BACnet Runtime x64' to Normal Level (lower levels like Debug, Debug Verbose or All may lead to increased BACnet connector load as well as TraceWorX log may become very large, especially on large BACnet networks).
5. If needed, save the captured packets to a the *.pcap file and send that to ICONICS support (including the TraceWorX log, if possible).