[Comments]

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1032-How many devices are supported on an AMX master

Summary

AMX cannot categorically state that any master supports a specific number of devices/connections since this value is dependent on the communication that is occurring across those connections. However, on the NX series masters, AMX has validated **256** ICSP devices under low/medium load conditions – each device receiving send commands twice per minute with manual touch panel interaction. Under these conditions there is no appreciable feedback latency, degradation of overall system stability, or performance. This validation is not intended to cover all programming scenarios but to assist in system design.

It is possible to write NetLinx code that is so traffic and processing intensive that a single device could consume all master resources. Conversely, many more than 256 devices/connections may be serviced by a single NX master if each device requires minimal traffic and processing.

256 is a good device quantity to use for NX system design purposes for normal traffic associated with simple AV devices and native AMX IP connected (ICSLan/ICSP) devices per master. 200 is NI equivalent (see detail below).

NI-Series

A single NI master supports a maximum number of 250 simultaneous IP connections. The maximum number of simultaneous IP ICSP (NetLinx device) connections supported by a single master is 200. Some of the remaining 50 are intended to be used for internal services i.e. ftp, telnet, http, etc… Some can be used for IP connections via NetLinx code IP_CLIENT_OPEN, IP_SERVER_OPEN, and Duet modules. As all IP resources come out of the same resource pool, increasing the number of NetLinx code IP connections may necessitate a reduction in ICSP NetLinx device connections in order to say with limited of total IP connections.

Additionally, there is a maximum number of 200 entries in a URL List. This limit is only important as it relates to very large master-to-master systems, but it should be noted that each URL entry consumes a device/socket of total allocation.

NetLinx device IP connections -- max 250

M2M URL entries -- max 200

NetLinx code IP connections -- max 200

Java code IP connections (Duet modules) -- not bounded

Total IP connections -- max **250** (arbitrary boundary based on connection type boundaries and system resources)

NX-Series

There is no hard limit enforced on number of simultaneous IP connections. The NX uses some sockets for internal services like ftp, telnet, http, etc… Additional sockets can be used for IP connections used in the NetLinx code via IP_CLIENT_OPEN, IP_SERVER_OPEN, Duet modules, native AMX IP devices, and master-to-master connections.

Device/connection limitations are relative to master resources consumed per connection. 256 is a validated quantity per master which can be used for design purposes assuming "normal" traffic/processing per device. There is still a limitation of 200 master connections in URL list for master-to-master communication.

For more technical information about spreading devices across multiple masters please see TechNote 919: http://www.amx.com/techsupport/PDFs/919.pdf

NetLinx device ICSP connections -- not bounded

M2M URL entries -- max 200

NetLinx code IP connections -- max 200

Java code IP connections (Duet modules) -- not bounded

Telnet sessions -- max 5

Total IP connections -- not bounded subject to above connection type limitations (max **256** suggested boundary depending on traffic/processing load)

Master Connection Modes

The mode of communication used for connection of AMX/ICSP (IP) devices to the Master is specified via the SET CONNECTION Telnet Command. Connection mode setting options are AUTO, TCP URL, UDP URL, or NDP (default) as described:

AUTO – This mode utilizes TCP communication. It looks for a matching system number and attempts to come online with the first master it sees with that system number.

TCP URL – TCP; the Master is specified via URL.

UDP URL – UDP; the Master is specified via URL.

NDP – UDP; this mode utilizes the NDP binding process to assign the DXLink Module (the physical device) to a master (or Virtual Master) via NetLinx Studio. Once bound, communications are conducted via UDP.

Note: *In URL modes, the Master can use either an IP address or a DNS name.*

Guidelines

UDP mode is recommended for the following types of installations:

- Small-to-medium residential and corporate installations on a single subnet
- Segmented control network installations (control network is a separate switching domain and subnet from other network equipment)
- Installations with the total number of NetLinx / ICSNET devices on a single master exceeding 128

TCP mode is recommended for installations where (a) the switching domain of the network is subject to **"**bursty**"** traffic or heavy streaming activity (>20 Mbps consumption by streaming) **and** where (b) the total number of NetLinx / ICSNET devices on a single Master is less than 128.

TCP vs. UDP

- **TCP** – Protocol has a built-in retry mechanism.
- **UDP** – Protocol does not have a built-in retry mechanism, but consumes fewer resources on the Master. AMX's UDP implementation of NetLinx employs a retry mechanism to provide the reliability of TCP with the resource efficiency of UDP.

URL vs. NDP vs. Auto

Determining which connection method to use for Master Connection Mode is essentially a matter of deciding what information the device should use to identify the correct Master to connect to. The default mode is NDP; the mode can be changed via the SET CONNECTION Telnet command.

- **URL** – The device connects to the Master with the specified URL. The device must be configured with the URL of a specific Master via the SET CONNECTION Telnet command.
- **NDP** – The device connects to the Master it's been bound to, which is based on the Master's MAC address. The binding is configured via NetLinx Studio. Once bound, the device must be unbound using either NetLinx Studio or the Telnet NDP UNBIND command before being re-bound to a different Master. Alternatively, NDP devices can be bound/unbound via options on the Master's Web Configuration pages (System > Manage NetLinx). For details, refer to the *NetLinx Integrated Controllers - WebConsole & Programming Guide* (System - Manage NetLinx section).
- **Auto** – The device connects to the first Master it finds with the specified System Number. The device must be configured with the desired system number via the SET CONNECTION Telnet Command. Use of this method requires that only one Master has any particular system number and is visible to the subnet. If this is the case, then Auto is the simplest choice. However, with Auto, you are not hard-bound to a particular Master. Therefore, if at some point in the future, another Master is configured with the same system number, the result is that the DXLink Module could show up on that other Master.