Xstation Problem Solving Hints

Special Notices

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> **Note:** The information in this document has **not** been verified for AIX 4.1.

About this Document

This document contains tips for determining Xstation booting problems. For more details, refer to AIX Xstation Manager/6000 Version 1.4.1 System Management Guide (SC23-2264-05).

How to Read the LAN Statistics Screen

The LAN statistics screen appears on the Xstation terminal as it boots. Copyright and Xstation Manager information appear at the top of the screen followed by relevant LAN information. Also displayed will be the network adapter's hardware address and relevant information about the adapter's connection mode.

Two lines are displayed for each working LAN adapter. Lines labeled "BOOTP:" give information about the transmission/reception of bootp packets. Lines labeled "TFTP:" give information about the transmission/reception of tftp packets.

Reading from left to right in either the BOOTP or TFTP line, interpret the fields as follows:

1. Bootp or tftp packets sent by the Xstation
2. Bootp or tftp packets received by the Xstation
3. Total number of packets (any type) received by the Xstation
4. Packets sent but received "no response"
5. TFTP error field:
   66XX numbers indicate token ring errors
   77XX numbers indicate SLIP errors

88XX numbers indicate Ethernet errors

Ethernet Considerations

Ethernet connector type selection is done by jumper settings on the PCB. The default setting is usually "thin". To select "thick" or "10BaseT", consult the appropriate Setup and Operator's Guide for the Xstation.

Compliance with IEEE802.3 standards are required for proper operation. Ensure that only 50-ohm IEEE802.3 cables, connectors, and terminators are used throughout the network. Just one section of 90-ohm cable can cause "dead" spots in the network.

For "thin" net (coaxial) Ethernets, do not use more than 30 stations per segment and ensure the the length of each segment is less than 185 meters.

For "thick" net Ethernets, use only IBM approved transceivers or the IBM cable adapter which ships with Xstation 140s, 150s and 160s.

Problem Determination

- Boot failure (general)

  An unsuccessful boot may have an underlying cause, especially if the Xstation had previously been operating satisfactorily. Check:

  1. Basic connectivity:

     Can the Xstation be pinged (with the "ping" command) by the boot host during the boot process? If the ping hangs, interrupt it (<ctrl>C) and run "arp -a". Does the Xstation show up in the arp table? Does it give the Xstation name, IP address, then "at <incomplete>"? If so, a physical path to the Xstation has been broken or a possible Xstation hardware problem exists. Check routers, gateways, concentrators, etc. between the boot host and the Xstation.

  2. Host name resolution:

     Is DNS or NIS being used? If so, can the DNS server be pinged? Do forward and reverse name resolution still work for both the boot server and Xstation host name/IP address? If not, take appropriate action to ensure proper name resolution to the network.

  3. NIS services map:

     If you are using NIS, does "ypcat services" show these:

     ```
     bootps 67/udp
     bootpc 68/udp
     x_st_mgrd 7000/tcp  (if x_st_mgr 1.3 or below) or
     x_st_mgrd 9000/tcp  (if x_st_mgr 1.4 or above)
     ```

If not, modify the NIS master server to provide these services in its NIS services map by editing the /etc/services file and remaking the maps.

- Bootp failure

  Bootp is a broadcast mechanism the Xstation uses to find its server. If bootp is enabled but the packets are not answered, the Xstation LAN statistics screen will show field 1 (bootp packets sent) incrementing, field 2 (packets received) at 0 and not incrementing, and field 4 (packages sent with no reply received) incrementing.

  If bootp is enabled but the packets are not answered, perform the following checks:

  1. Check the server process table for bootpd:

     ```
     ps -ef | fgrep bootpd
     ```

     If no bootpd process is running, check inetd for "active" bootps:

     ```
     lssrc -ls inetd
     ```

     If the bootps subserver is not "active", then enable it via smit or the command line:

     Via smit:

     a. Start smit with "smit inetd".
     b. Choose "inetd Subservers" and then "Add an inetd Subserver".

     Via the command line:

     a. Edit /etc/inetd.conf and uncomment the bootps line.

     b. Run the following commands to activate the change:

        ```
        inetimp
        refresh -s inetd
        ```

  2. If bootpd still does not run, check the permissions on bootpd:

     ```
     ls -l /usr/sbin/bootpd
     ```

     If the permissions are not "-r-xr-xr-x bin bin", change them so that they are.

  3. If bootpd is running in the process table, check the system date with the command "date".

     If the time and date do not appear to be correct, enter the following, replacing MMDDHHmmYY with the current time and date:

     ```
     date MMDDHHmmYY
     ```

     Then enter

     ```
     touch /etc/bootptab
     ```

     to make its date/time current and to enable a new bootpd to be spawned the next time a bootp request is received.

4. Check the permissions and contents of the /etc/bootptab file. To check the permissions, run "ls -l /etc/bootptab". It should return "-rw-r--r-- root system". If not, correct the permissions and run "touch /etc/bootptab" and "refresh -s inetd". Then retry the boot.

   Check the contents of the /etc/bootptab file and verify that there are no blank lines, that there is a network type line, and that there is an Xstation line with the proper entries for the topology and configuration. If necessary, correct the file.

5. Finally, if everything looks good and bootpd is being kicked off but is not responding to the Xstation requests, initiate bootpd with debugging by doing the following:

   a. Edit /etc/inetd.conf and comment out the "bootps..." line.

   b. Run "inetimp" and "refresh -s inetd".

   c. Start bootpd manually, sending the output messages to the console or to a file:

      To run bootpd with output to the console:

      ```
      bootpd -d -d -d -d -s &
      ```

      To run bootpd with output to a file:

      ```
      bootpd -d -d -d -d -s > /tmp/bootpd.out 2>&1
      ```

- TFTP failure

  If bootp succeeds, a handoff is made to request tftp download of the Xserver code. (Note: Certain Xstation models can load locally from FLASH memory and may not need a tftp download.) A symptom seen at the Xstation may be that the tftp packet counts increment slowly and eventually timeout. Error codes 66XX for token ring or 88XX for Ethernet may be posted in the fifth tftp field.

  If tftp fails, do the following:

| 1. Run "lssrc -ls inetd" and check for tftp "active". If it is not active, check
| that the /etc/inetd.conf file contains the following line and that it is not
| commented out;

| tftp dgram udp wait nobody /etc/tftpd tftpd -n

| 2. Check tftpd permissions (try tftp <hostname> manually).

3. Check for an active "nobody" account. The tftp subserver is "owned" by the "nobody" user in inetd.conf. If the account has expired or its home directory (/) has the wrong permissions or ownership, tftpd will not work correctly. Add the "nobody" account, or (alternatively) change the ownership of tftp in the /etc/inetd.conf file to "root", run "inetimp" and "refresh -s inetd", and then try the boot again.

| 4. Check that the /etc/services file contains the following line:

| ```
| tftp 69/udp
| ```

5. If an /etc/tftpaccess.ctl file exists, verify that /etc/x_st_mgr and /usr/lpp/x_st_mgr/bin have "allow:" lines in the file.

- Booting through gateways and routers

  If you are booting through a gateway, router, or bridge, the Xstation IP address, host IP address, and gateway IP address, and subnet mask must be entered into the Xstation's Network Setup menus. If you have a bridge or router with no IP address, use the boot host's IP address as the gateway address. Additionally, you should change bootp mode to "direct" or disable it completely.

- Xstation Manager problems

  If the Xstation tftp works (the first two tftp counters quickly increment to about 500) but error messages or a white screen with no error messages appears on the Xstation, check the x_st_mgrd process. Examples of error messages include:

  ```
  Could not connect to fileserver
  Could not read configuration file
  Cannot load X server code
  ```

  1. Check to see that the x_st_mgrd process is running:

     ```
     ps -ae | grep x_st_mgrd
     ```

     If it is not running, start it from the command line by running:

     ```
     /etc/rc.tcpip
     ```

  2. If x_st_mgrd is running, check /etc/services (or "ypcat services" if running NIS) and verify that x_st_mgrd is assigned a port:

     ```
     9000/tcp    (if running x_st_mgr 1.4 or above)
     7000/tcp    (if running x_st_mgr 1.3 or below)
     ```

     If the entry for x_st_mgrd is not found, edit the /etc/services file and add the entry; then configure the change into the ODM by running "inetimp" and "refresh -s inetd". (Note: If you are using NIS, be sure to make the change on the NIS master; then run "make" from /var/yp.)

     Finally, kill the x_st_mgrd process and restart it using the command in the last step (the first step for Xstation Manager problems). Also, verify the Xstation name and that it does not begin with an x.

  3. If x_st_mgrd is running and its port is registered, check the /etc/bootptab file and verify that the x_st_mgr line ends with:

     ```
     T170=2328   (if x_st_mgr 1.4 or above) or
     T170=1b58   (if x_st_mgr 1.3 or below)
     ```

     If the tag is missing, add it and reboot the Xstation.

- If the Xstation displays "Could not read configuration file" or "Cannot load Xserver code", check permissions:

  ```
  cd /usr/lpp/x_st_mgr/bin
  ls -l *
  ```

Check for 644 ("-rw-r--r--") on the following files:

```
bootfile<n>
X140serv    (if applicable)
X150serv    (if applicable)
x11xor3.out
x11xor4.out
```

Then run:

```
cd /etc/x_st_mgr
ls -l *
```

Check for 644 ("-rw-r--r--") on the following files:

```
bootfile<n>.cf
X140serv.cf   (if applicable)
X150serv.cf   (if applicable)
x_st_mgrd.cf
x_st_mgrd.tmty
```

(Where <n> may be 1 and 2 or 3 and 4, depending on x_st_mgr version.)

If any of the above files have the wrong permissions or ownership (root/system), then change to the proper permissions and ownership and restart x_st_mgrd using the command in the first step under "Xstation Manager problems" above.

- If the screen appears grey and the mouse pointer cursor looks like a white rectangle, it means that the Xstation cannot load the cursor font file. In this case, check the Xstation font path.

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