

MediaMatrix®

A Division of Peavey Electronics Corporation



**n**NWare

## Pandad Administrator Guide

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## Scope

This guide describes how Pandad works in both standard and interactive modes, and includes several procedures that will help you manage Pandad on the network.

This guide has been written for system administrators and network designers who intend to configure their networks with multiple subnets.

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# Chapter 1

# Introducing Pandad

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## Introduction

A typical MediaMatrix installation will have access to two separate networks. A MediaMatrix installation also has two separate network connection jacks used to access a Control Network and an Audio Network. NWare, NWare Kiosk and MediaMatrix devices will typically access only the Control network. The Control network is used to connect together all of the devices on the network that will exchange control and monitoring data with each other in one or more Projects. This is a data network and should not be confused with the Audio Network used to transport digital audio between devices using a Dante network. A PC running NWare will access the Control Network through its NIC, or Network Interface Card.

Every time NWare is started a service called Pandad is also run. This service is used to discover the MediaMatrix devices on the network. For Pandad to work it must be configured so that Pandad runs on the correct interface to access the Control Network.

## How Pandad works

Pandad creates and maintains a list of all MediaMatrix nodes on the network. Here are the steps in the process:

1. On the control computer, Pandad listens for multicast packets from other instances of Pandad on the network. It then sends its own multicast packet.
2. Pandad instances on each MediaMatrix node and the control PC respond with their device lists.
3. On the control computer, Pandad creates a list of all the devices on the network from the replies it receives.

As with all discovery processes, this broadcast bursts in the beginning and quickly tapers off. Small multicast packets are then sent every five seconds.

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### Notes:

- If there is more than one network interface available on the control computer (wired or wireless), when NWare is first started, a dialog box will open that asks which network interface to use for communications. The correct interface *must* be selected or no devices will be found on the network.
  - If your network is using multicast filtering, it may interfere with Pandad. We recommend that you disable this feature.
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## Chapter 2

# Linking instances of Pandad across subnets

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## Introduction

A typical MediaMatrix installation will have access to two separate networks. A MediaMatrix installation also has two separate network connection jacks used to access a Control Network and an Audio Network. NWare, NWare Kiosk and MediaMatrix devices will typically access only the Control network. The Control network is used to connect together all of the devices on the network that will exchange control and monitoring data with each other in one or more Projects. This is a data network and should not be confused with the Audio Network used to transport digital audio between devices using a Dante network. A PC running NWare will access the Control Network through its NIC, or Network Interface Card.

Every time NWare is started a service called Pandad is also run. This service is used to discover the MediaMatrix devices on the network. For Pandad to work it must be configured so that Pandad runs on the correct interface to access the Control Network.

## Starting Pandad in Interactive Mode

1. Open Windows Explorer, and then navigate to the NWare installation folder.
2. Double-click *pandad.exe* to start Pandad in Interactive Mode.

The `pandad>` prompt is displayed. You can now enter commands. Type `help` to see a list of valid commands.

If Pandad is already running on your PC, this message will be displayed:

```
pandad: a previous instance is already running!
```

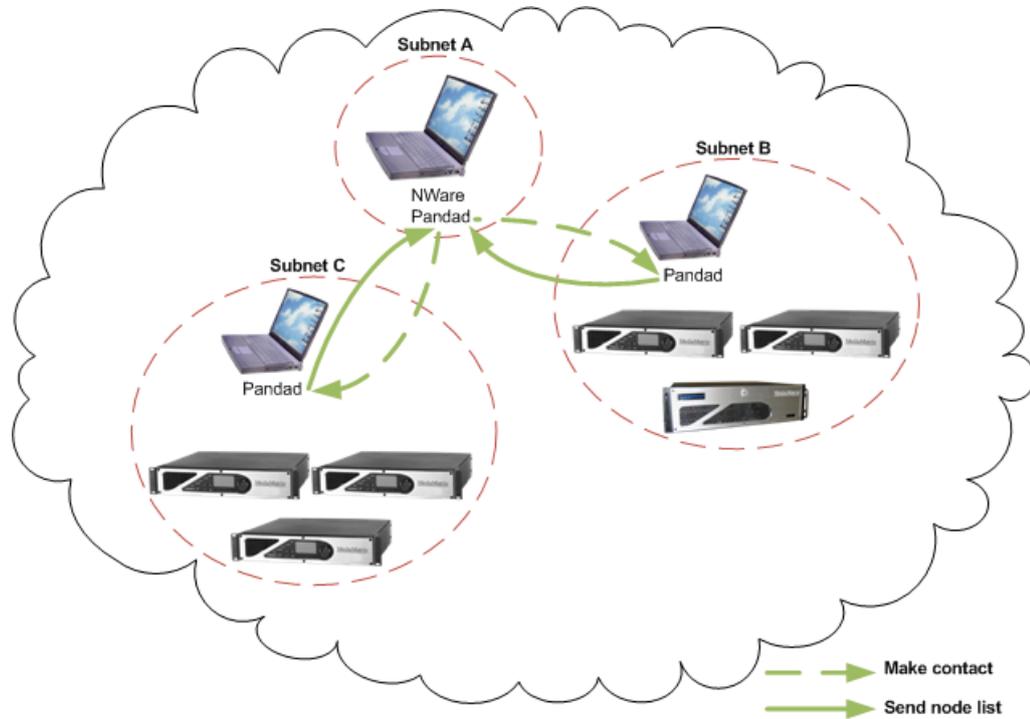
```
pandad: Interactive mode - not first instance, so will close ...
```

Open Windows Task Manager, close the *pandad.exe* process, and then repeat step 2 above.

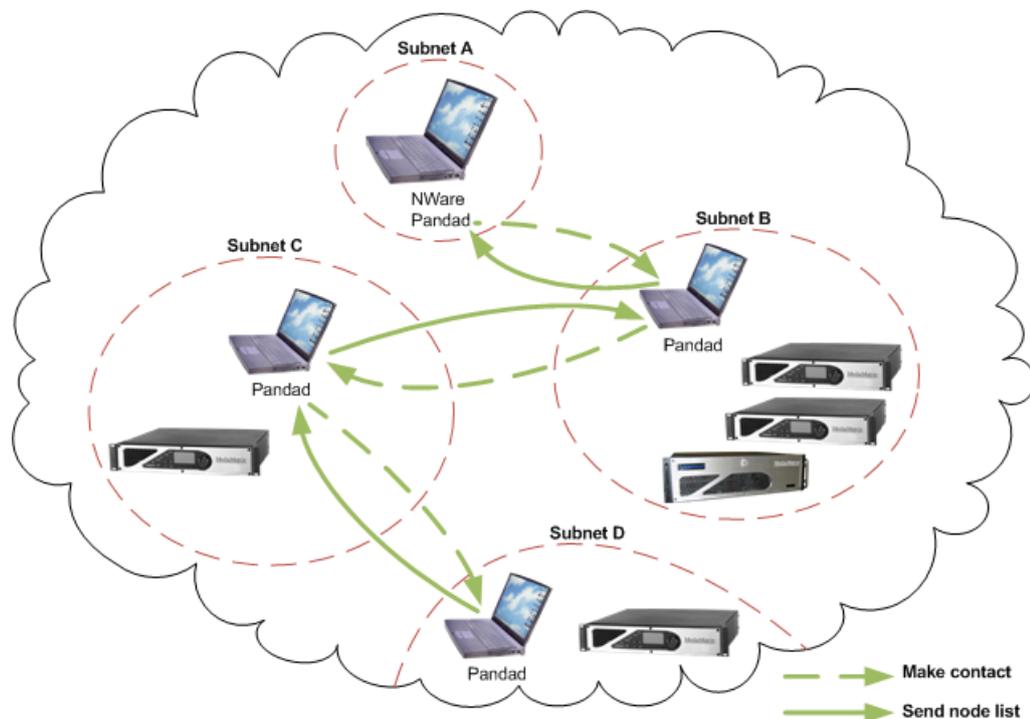
## Establishing and monitoring remote links

Pandad can be configured to connect to other instances of Pandad on the network. The other instances, in turn, provide lists of MediaMatrix nodes on their local subnets. This allows the NWare user to view a complete list of all nodes on the network, even if they are located on different subnets and need to be contacted through routers, firewalls or using VPN bridges.

The diagram below shows a typical network topology where this feature would be used. Node lists from subnets B and C are provided to NWare on subnet A by the instances of Pandad.



Each remote instance of Pandad that is contacted can, in turn, contact further instances on other subnets to retrieve details of nodes. This allows a chaining of the Pandad instances across the network, as shown below.



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**Notes:**

- In order for the system to work, each PC must be configured with the correct network settings so that the remote PCs and nodes can be reached. If you cannot *ping* a remote address, you will not be able to use it.
  - It is very important that two instances of Pandad on two different PCs are *not* configured to request lists of nodes from each other. This creates a loop and will stop Pandad functioning. Node details must only be reported from one instance of Pandad to another, but not in the reverse direction as well. Generally, we recommend configuring Pandad to contact remote nodes, rather than NWare PCs, to avoid this issue.
  - We do not recommend that you deploy a project through a remote connection. A better solution would be to use a virtual desktop software package to connect to a computer on the remote subnet and then initiate project deployment.
  - If two instances of Pandad are separated by a firewall, you will need to open port 4000 on the firewall to ensure they can communicate.
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**Tip:** As an alternative to configuring Pandad to contact other instances of Pandad on the network, you can use a *MediaMatrix Subnet Bridge* device in NWare. For more information, see *MediaMatrix Subnet Bridge* in the *NWare Device Reference*.

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## Setting up links manually

### ▶▶ **To discover remote nodes from an instance of Pandad**

- Type the following command, replacing `xxx.xxx.xxx.xxx` with the IP address of the remote PC that is running Pandad:

```
remote_link xxx.xxx.xxx.xxx
```

### ▶▶ **To display a list of all the remote links that have been configured**

- Type `remote_link_status`  
Pandad will display a list of all remote links and the connection status (1 means the link is connected; 0 means the link is not connected).

## Setting up links automatically

You can use *pandad.cfg.xml* to instruct *pandad.exe* to automatically load information on nodes detected by other instances of Pandad on the network, each time Pandad is started.

### ▶▶ **To set up links automatically**

1. Navigate to the NWare installation folder.
2. Make a copy of the file *pandad.cfg.xml*.

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**Note:** It is important to create a backup copy of *pandad.cfg.xml* file to ensure you can return to the original configuration if required.

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3. Open *pandad.cfg.xml* in a text-editing program like Windows Notepad.
4. Add some blank lines between the last end comment command (`-->`) and the end Panda command (`</panda>`), then position the cursor in the space you have created.

5. If you want Pandad to discover remote nodes from another instance of Pandad, type the following command, replacing `xxx.xxx.xxx.xxx` with the IP address of the remote PC that is running Pandad:

```
<remote_link ip="xxx.xxx.xxx.xxx" local_only="1" />
```

If you want Pandad to discover remote nodes from another instance of Pandad, plus other linked instances of Pandad, the following command, replacing `xxx.xxx.xxx.xxx` with the IP address of the remote PC that is running Pandad:

```
<remote_link ip="xxx.xxx.xxx.xxx" local_only="0" />
```

---

#### Tips:

- You can add multiple *remote\_link* commands to contact other instances of Pandad on other PCs.
  - There are examples of using the *remote\_link* command in the commented out sections in the *pandad.cfg.xml* file.
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6. If you want to specify an alternative IP address for a *remote\_link* command to use should the primary address become unreachable, specify the second address using the *alternate* command. For example:

```
<remote_link ip="192.168.1.101" local_only="0">
```

```
<alternate ip="192.168.1.102"/>
```

7. Save the file.
8. Start either *NWare.exe* or *Pandad.exe* to check your modifications are correct and the system works.

## Checking that instances of Pandad can communicate

In Interactive Mode, you can use the *list* command to contact other instances of Pandad on the network. The output from this command will determine whether the Pandad instances can be reached and help you check that your Pandad configuration and your network configuration are working.

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**Tip:** You can type `help` to display a list of available commands.

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### ► To check that instances of Pandad can communicate

1. Open Windows Explorer, and then navigate to the NWare installation folder.
2. Double-click *pandad.exe* to start Pandad in Interactive Mode.
3. Type `list`.

First of all, Pandad will return information about the local instance of Pandad, i.e. the one running on your PC that you are now using in Interactive Mode:

```
local keys : 1
10.18.16.139/pandad/debug_menu_v1
```

Next, Pandad displays information about other instances of Pandad on the network - on PCs and also on MediaMatrix nodes:

```
remote keys :
remote 10.18.16.110 1
10.18.16.110/pandad/debug_menu_v1
```

```
remote 10.18.16.116 1
10.18.16.116/pandad/debug_menu_v1
remote 10.18.16.120 47
...
```

4. Check that the IP addresses of all the PCs and nodes you want NWare and NWare Kiosk users to work with are shown.

## Shutting down Pandad in Interactive Mode

- At the command prompt, type `exit`.

---

**Tip:** As an alternative, you can click the red **X** in the upper right-hand corner. However, using the `exit` command will provide feedback you can see while Pandad Interactive Mode unsubscribes from the multicast group, destroys the orb, and closes the window.

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# Chapter 3

## Troubleshooting

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## How Pandad can stop functioning

There are several actions that can cause Pandad to stop functioning while it is running on the control PC:

- Changing the IP address of the network interface after Pandad has started.
- Unplugging the network cable, or otherwise interrupting network communications.
- Shutting down, then restarting NWare before Pandad has had an opportunity to exit.

## Determining if Pandad has stopped functioning

Here are a few symptoms that indicate Pandad has stopped functioning:

- No MediaMatrix nodes are listed on the **Remote Log** tab of the Output Frame in NWare, but the devices respond when you use the PING command to contact them.

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**Note:** If the nodes do not respond to the PING command, there is a problem with the network.

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- All the nodes on the **Remote Log** tab of the Output Frame in NWare show IP addresses instead of node names.
- No nodes are listed on the **Role Deployment** dialog box.
- No projects are listed on the **Upload and Connect** dialog box.
- No projects are listed on the dialog box when starting NWare Kiosk.

## Recovering Pandad after it has stopped functioning

When Pandad stops functioning, it can be recovered without shutting down NWare.

### ► **To recover Pandad after it has stopped functioning**

1. On the control computer, press CTRL+ALT+DEL to open Windows Task Manager.
2. Click the **Processes** tab.
3. In the **Image Name** column, click **pandad.exe**.

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**Tip:** You can click on the column header to sort all entries alphabetically.

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4. Click **End Process** to close *pandad.exe*.
5. Close or minimize Task Manager.
6. Open Windows Explorer, then navigate to the root of the version of NWare you are using (the root is where you find *NWare.exe*).
7. Double-click *pandad.exe* to start Pandad in Interactive Mode.  
A Command Prompt window will open.
8. Open Windows Task Manager and check that *pandad.exe* is listed.
9. Open NWare and check that all the nodes are listed on the **Remote Log** tab.

It may take a few seconds for the nodes to appear in the list.

If a deploy operation or upload and connect operation was interrupted when Pandad stopped working, it will now continue.

## **How Pandad in Interactive Mode can stop functioning**

There are several actions that can cause Pandad to stop functioning while it is running in Interactive Mode:

- Changing the IP address of the network interface after Pandad has started.
- Unplugging the network cable, or otherwise interrupting network communications.

## **Recovering Pandad in Interactive Mode after it has stopped functioning**

- Stop and restart Pandad Interactive Mode.

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