Datatek

Supplement to
DT-6061
User's Manual

Platform

For IP-LTCN Application

Issue 1

Datatek
APPLICATIONS, INC

CONTENTS

IMPORTANT SAFETY INSTRUCTIONS

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

When installing, operating, or maintaining this equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

❑ Read and understand all instructions.

❑ Follow all warnings and instructions marked on this product.

❑ For information on proper mounting instructions, consult the User's Manual provided with this product.

❑ The telecommunications interface should not leave the building premises unless connected to telecommunication devices providing primary and secondary protection.

❑ This product should only be operated from the type of power source indicated in the User's Manual.

❑ This unit must be powered from either –48 V DC or AC voltage sources. See User's Manual before connecting to the power source.

❑ The –48 V DC input terminals are only provided for installations in Restricted Access Areas locations.

❑ Do not use this product near water, for example, in a wet basement.

❑ Never touch uninsulated wiring or terminals carrying direct current or leave this wiring exposed. Protect and tape wiring and terminals to avoid risk of fire, electric shock, and injury to service personnel.

❑ To reduce the risk of electrical shock, do not disassemble this product. Trained personnel should perform Service only. Opening or removing covers and/or circuit boards may expose you to dangerous voltages or other risks. Incorrect re-assembly can cause electric shock when the unit is subsequently used.

❑ For a unit intended to be powered from –48 V DC voltage sources, read and understand the following:

❑ This equipment must be provided with a readily accessible disconnect device as part of the building installation.

❑ Ensure that there is no exposed wire when the input power cables are connected to the unit.

❑ Installation must include an independent frame ground drop to building ground. Refer to User's Manual.

This symbol is marked on the DT-6061,
adjacent to the ground (earth) area for the
connection of the ground (earth) conductor.

THIS EQUIPMENT IS TO BE INSTALLED ONLY IN RESTRICTED ACCESS AREAS ON BUSINESS AND CUSTOMER PREMISES APPLICATIONS IN ACCORDANCE WITH ARTICLES 110-16, 110-17, AND 110-18 OF THE NATIONAL ELECTRICAL CODE, ANSI/NFPA NO. 70. OTHER INSTALLATIONS EXEMPT FROM THE ENFORCEMENT OF THE NATIONAL ELECTRICAL CODE MAY BE ENGINEERED ACCORDING TO THE ACCEPTED PRACTICES OF THE LOCAL TELECOMMUNICATIONS UTILITY.

❑ For a unit equipped with an AC Wall Plug-In Unit, read and understand the following:

❑ Use only the K'TRON, Model KA-52A Wall Plug-In Unit shipped with this product.

❑ Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

❑ Do not staple or otherwise attach the power supply cord to the building surfaces.

❑ Do not overload wall outlets and extension cords as this can result in the risk of fire or electric shock.

❑ The socket outlet shall be installed near the equipment and shall be readily accessible.

❑ The Wall Plug-In unit may be equipped with a three-wire grounding type plug, a plug having a third (grounding) pin. This plug is intended to fit only into a grounding type power outlet. Do not defeat the safety purpose of the grounding type plug.

❑ Do not allow anything to rest on the power cord. Do not locate this product where persons walking on it may abuse the cord.

❑ Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

    a) When the powers supply cord or plug is damaged or frayed.

    b) If liquid has been spilled into the product.

    c) If the product has been exposed to rain or water.

    d) If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions because improper adjustment of other controls may result in damage and will often require extensive work by qualified technician to restore the product to normal operation.

    e) If the product has been dropped or the cabinet has been damaged.

    f) If the product exhibits a distinct change in performance.
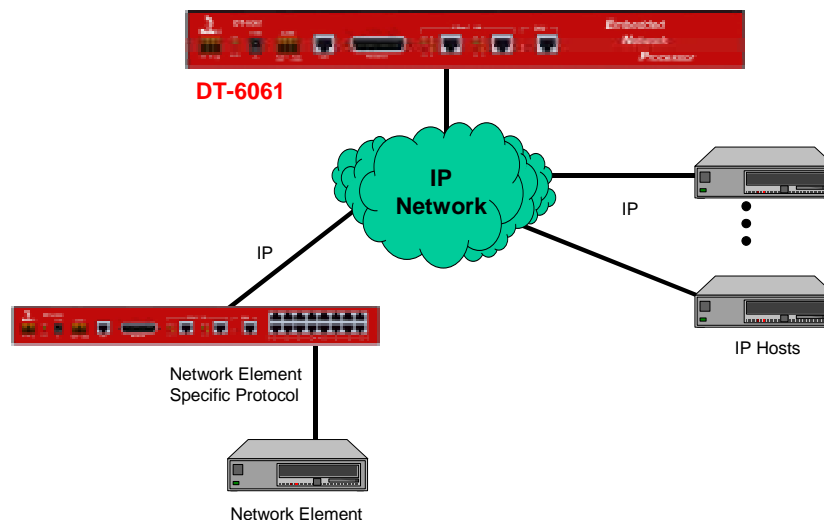
SAVE THESE INSTRUCTIONS

1   INTRODUCTION

The DT-6061 *(Embedded Network Processor)* is a network applications computer that applies customer specific protocol operations *(protocol translation and termination)* of network connections that require such a function in a distributed network.

The DT-6061 supports a multitude of applications, and may support combinations of these applications simultaneously. The elements common to all applications are provided by the DT-6061 hardware and operating environment. In addition, the DT-6061 has an SNMP agent that is completely independent of any application.

The basic configuration for the DT-6061 may be as follows:

DT-6061

IP
Network

IP

IP

IP Hosts

Network Element
Specific Protocol

Network Element

In the above figure representing a generic configuration for a DT-6061, the Network Element *(NE)* communicates with IP Hosts over an IP Network using the DT-6061 as an intermediary for protocol conversion / termination. The NE uses its specific communications protocol to talk through a DT-4000 or some other device(s) that will bridge the NE with an IP infrastructure. The DT-6061 running one of its custom applications performs the necessary protocol translation or termination allowing the NE and IP-Hosts to ultimately communicate.

One of the DT-6061 applications, called IP-LTCN, is used in conjunction with specialized functionality in the DT-4000 or DT-4180 to provide the communications with test heads, do the protocol translations from BX.25, etc to IP, and perform the other special handling functions required for the Tollgrade® Communication's LoopCare™ Test Operations Support System. This

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supplement provides specific changes and additions to the "DT-6061 User's Manual (Platform)" that apply to the IP-LTCN application on the DT-6061. The complete description, installation procedures, commands, etc for the DT-6061 platform are contained in the "DT-6061 User's Manual (Platform)" to which the user should refer for more detail. This supplement is intended to be a "cookbook" for the IP-LTCN application administrators.

1.1 APPLICATIONS AND INSTANCES

A single DT-6061 host can support up to 30 copies, called *instances*, of an application. Because of the requirements of the IP-LTCN application, only one copy of the IP-LTCN application can be installed on a DT-6061 host and always in instance 1. No other applications can be installed on this host. Therefore, any commands input via the DT-6061 console requiring an instance number as a parameter should always use as its value "1".

1.2 HIGH AVAILABILITY OPTION

The DT-6061 is available in a redundant configuration to provide high availability of the user's applications. A single *active* DT-6061 is coupled with a *standby* DT-6061 that is ready to take over automatically if the *active* DT-6061 fails for any reason. After the failed DT-6061 recovers, it is returned to service as *standby.*

For the LoopCare system, Tollgrade Communications, its supplier, wants the High Availability Option to be used in the following way for software updates: Instead of the installation of software from the active to the standby DT-6061, the DT-6061 platform administrator will install or update the software on both machines.

2 INITIAL CONFIGURATION

In order to configure a DT-6061 device, a console, which will be referred to as the DT-6061 console in the rest of this document, must be directly attached to the console port. (See section 5.1 of the "DT-6061 User's Manual (Platform)" for details.) After logging in, the administrator must configure the DT-6061's IP address, its associated address mask, and a gateway IP address. Then the IP-LTCN application can be installed, and assigned to instance 1. After that the administrator can configure a pair of DT-6061's for high availability.

Below is the DT-6061 configuration sequence. This assumes that the platform software has already been factory installed. Platform software is separate from application software. The platform software is the operating system and associated functions. The application software is the specific user program, such as IP-LTCN.

2.1 PLATFORM CONFIGURATION

The following is the command sequence for the initial configuration of the DT-6061.

```
<DT-6061> login passwd=initial ↵        enter "logged: in mode
User is logged in
<DT-6061> ipaddr 135.17.59.240 ↵        enter IP address of DT-6061
You must reboot for this change to take effect
<DT-6061> submask 255.255.255.0 ↵       enter Subnet Mask of DT-6061
You must reboot for this change to take effect
<DT-6061> gateway 135.17.59.1 ↵         enter Gateway Address of DT-6061 if necessary
You must reboot for this change to take effect
<DT-6061> reboot ↵
```

2.2   USER APPLICATION INSTALLATION

This action requires that a host, acting as an ftp server, is present on a network that is accessible by the DT-6061 install command. The current version of the IP-LTCN application can be downloaded to the ftp server from the Datatek Applications Inc.'s web site www.datatekcorp.com using the instructions which are accessed by clicking on the "software download" link on the web site.

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Note that the IP-LTCN application software may have been preinstalled at the factory or by the Datatek reseller. To determine this, do the following:

<DT-6061> vfy cfg ↵

The output should show IP-LTCN in instance 1 and nothing else in any of the others. If applications are assigned for any of the slots 2 through 30, or some other application other than IP-LTCN is shown in instance 1, for each instance delete the application assignment using the **app** command:

Syntax: app <instance> [num=<number>] type=none

To delete the application assigned to instance 2, the command is:

app 2 type=none

To delete all application assignments in instance 2 through 30, a shortcut command is:

app 2 num=29 type=none

See the user's manual for more details.

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Assuming the IP-LTCN application needs to be installed, do the following as well as the **app** command shown in the next section. The commands in this section and the next must be performed from the DT-6061 console. (See section 10 of the DT-6061 User's Manual (Platform)" for additional details.)

```
<DT-6061> install ↵
application or package name ? NAME=IP-LTCN ↵
name of ftp download server ? SRV=<server IP address in dd.dd.dd.dd
format> ↵
login on download server ? ID=<user's login> ↵
password ? PASS=<user's passwd> ↵
name of directory on server ? LOC=<location of application on the ftp
server> ↵ (For example, LOC=/dt6061/apps)

Downloading ...
Downloaded:
-rwxrwxrwx 1 root    0        79701 Apr  5 05:21 IP-LTCN.dt6
Testing ... xxx blocks
Installing ... xxx blocks
Install successful.
```

2.3   ASSIGNMENT OF THE IP-LTCN APPLICATION TO INSTANCE 1

As stated earlier, the IP-LTCN application must be the only application installed on the DT-6061 and must be assigned to instance 1. To assign the instance, do the following:

```
<DT-6061> app 1 type=IP-LTCN ↵      configuring instance #1 for installed application
Stopping 1 none(55)
PID 1033 running IP-LTCN 1
```

The **app** command causes the application to be started after the command finishes configuring it for instance 1.

At this point, from a PC or other device on the IP network, the administrator can telnet to port 10001, which is the console port number for the IP-LTCN application, in order to interact with the application program directly. For example, the administrator can check the version of the IP-LTCN via the following commands:

```
<IP-LTCN> login passwd=<initial | <password> >

<IP-LTCN> ver
```

The **ver** command output shows the current build number, software version, and database version of the IP-LTCN. The build number can be compared with the list on the Datatek web site that shows the current version of each application.

The administrator cannot access the application via the DT-6061 console; it must be done via telnet only. On the other hand, all DT-6061 device commands must be performed via the DT-6061 console.

2.4   SETTING UP THE REDUNDANT DT-6061

In order to configure a second DT-6061, repeat the steps in section 2.1, 2.2 and 2.3 for the second DT-6061. *Note that the second DT-6061 must have a unique IP address but it must use the same subnetwork address portion as in the address of the first DT-6061.* After completion of these steps, both machines are now in-service but not in high-availability mode.

2.5   HIGH AVAILABILITY OPTION

*The following sections (**2.5 through 5**) replace section 11 of the DT-6061 User's Manual (Platform). It reflects the usage of this option per the needs of the Tollgrade organization.*

The High Availability option couples two DT-6061 modules as an *active* and a *standby*. The *active* DT-6061 runs applications, while the *standby* "stands by" and monitors the *active* DT-6061. If the *active* DT-6061 fails or loses power, the *standby* will shortly take over the *active* role.

In *standby* mode, the DT-6061 has completed system boot, but has not started applications. A *standby* DT-6061 supports a subset of the commands in section 7 of the DT-6061 User manual for the DT-6061 platform plus a small number of commands for support of high availability, documented below. The prompt at the *standby* system console contains the word "standby".

Whenever a DT-6061 with high availability configuration boots, it first enters *standby* mode and begins to poll the other DT-6061 every few seconds across the IP network that joins them. There are three possible outcomes:

- The other DT-6061 doesn't respond (within a period of approximately 20 seconds), so this *standby* becomes *active*.

- The other DT-6061 is already *active*, so this *standby* updates its internal time-of-day from the *active* and continues to poll.

- The other DT-6061 is also in *standby*, so a brief negotiation follows, and one of them becomes *active*, while the other remains in *standby*.

The *standby* periodically polls the *active*. If the *active* DT-6061 fails to respond to probes from the *standby* (for approximately 25 seconds), the *standby* takes over as *active* by starting up the IP-LTCN application on itself.

The *active* also tracks the status of the other DT-6061, and remembers the most recent poll from the *standby*. If polls from the *standby* are overdue, the *active* initiates polling at a low frequency.

The physical proximity of the two DT-6061's must be near enough on the LAN to provide a reasonably reliable connection between the two DT-6061's. There can be intervening hubs and ethernet switches. However, *the subnetwork portion of the IP address of both DT-6061's must be the same*. Since each DT-6061 serves as the standby machine for the other, the two DT-6061's should have different power sources, i.e. be on different power circuits.

If the network connection between the *active* and *standby* is broken, the network becomes partitioned, the *standby* cannot receive responses from the *active*, and then the *standby* will take over as *active* (at least on the portion of the network where it remains connected). When the connection is reestablished, the two *active*s soon see each other (because an *active* initiates polling when the *standby* has not been seen) and respond to this impermissible situation by rebooting. Upon reboot, they negotiate to choose a new *active* and *standby.* Note that a reboot takes less than 30 seconds to complete.

2.5.1 CONFIGURATION FOR HIGH AVAILABILITY

Two new configuration objects are required for the high availability option: **ippublic** and **ipother**. Each DT-6061 has its own IP address that was configured in step 2.1 above. High availability configuration requires choosing a third IP address, **ippublic** that has the same network portion of its IP address as the two DT-6061's addresses. This *public* address is the one to be advertised to all other network elements that might be configured to interoperate with this DT-6061 pair. High availability is enabled by configuring each DT-6061 with both **ipother** (the **ipaddr** of the other DT-6061) and **ippublic**. Each DT-6061 must then be *rebooted* to enter high availability mode.

On each DT-6061, key-in the following from the DT-6061 console:

```
Syntax: ippublic <ipaddress>
        ipother <ipaddress>
        reboot
```

The initial setup of a pair of DT-6061's is now complete.

Tip: If your installation has already been running with a single DT-6061, and now a second DT-6061 is being added to enable the high-availability option, make the **ippublic** address the same as the IP address of the existing DT-6061, and give it a new IP address. This way, the IP addresses in the DT-4000's and DT-2020/DT-2020I[1] converted SAMs used by various network elements to point at the DT-6061 will not have to be changed.

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[1] The DT-2020 and DT-2020I are two products available from Datatek Applications, Inc which permit the conversion of an existing SAM8, SAM16, SAM64, SAM128 or SAM504 (with 128 ports or less) for use

3   UPDATED APPLICATION INSTALLATION

From time to time as needed, new application or DT-6061 platform software is released. The recommended procedure for installing new application or platform software is to use the **install** command on both the *active* and *standby* DT-6061. It doesn't matter which DT-6061 is updated first. However, it is recommended that the installation be performed on the *standby* system first. Follow the directions in section 2.2 above to install new application software. After installing on the *standby only,* do a **switchover** to force the *standby* to become the *active.* Then run for a while. That way, if some problem is experienced as the result of using the updated application, simply switch back to the old *active* which has the previous build of the application software. After a sufficient period (the administrator decides the length), if everything is running satisfactorily, install the updated application on the *standby* that was previously the *active* system.

Note that the install process automatically restarts the IP-LTCN application after it completes on the *active* system.

Note for installing new platform software, the procedure is very similar. However, separate instructions will be sent in the release notes that accompany the platform software.

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4   SWITCHOVER – HIGH AVAILABILITY MODE

Syntax: switchover

The **switchover** command, available only at the console of the *active* DT-6061, <u>forces</u> a switchover to the *standby* DT-6061. The former *active* DT-6061 then reboots itself into *standby* mode. (In contrast, if a **reboot** command is performed at the *active* console, that simply reboots the *active* DT-6061 back to *active* mode. Note also that when REBOOT is used on an active DT-6061, the standby allows the *active* a little extra time to complete so that the *standby* does not mistakenly think the *active* is down and cause a switchover.)

5   DT-6061 COMMANDS NOT AVAILABLE IN *STANDBY* HIGH AVAILABILITY MODE

The following commands are not allowed at the console of a *standby* DT-6061 enabled for high-availability:

- app
- backup
- dtproduct
- remove
- restart
- retrieve
- rstapp
- stby
- switchover
- timezone

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in an IP only network. All ports support only IP endpoints. See the Datatek web site at www.datatekcorp.com for more details.

The **help** command at the *standby* console shows only the commands that ARE allowed. The **date** command at the *standby* console may not be used to change the date. The *standby* receives the current time from the *active.*

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The warranty period for hardware shall be one year from the date of delivery. Replacements and repairs are guaranteed for the longer of the remaining original warranty period or 90 days.

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