

Options for Managing a DTC Remotely

White Paper

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1. Overview

The Datacomm Terminal Controller (DTC) product is a multi-protocol networked device used at many MPE/iX and HP-UX sites to provide networked access to the system via many different protocols (e.g. serial terminal, serial printer, Telnet access, X.25 PAD, X.25 System to system..etc). Configuration and management of the DTC can be done either through system-based utilities, such as NMMGR or DTCMGR/UX or a PC based utility that sits on top of Openview, the OpenView DTC Manager (OVDTCMGR).

The OVDTCMGR utility was developed so a single point of management could be used to manage a complex network of HP systems and DTCs that would be separated from the tasks and operations on any of the HP server systems. OVDTCMGR was originally developed to run on top of OpenView written for version 3.1 of the Microsoft Windows operating system. In the following years, OVDTCMGR was updated to run under Windows 95 and Windows 98.

At the time of the OVDTCMGR utility development, a decision was made that the OVDTCMGR program was going to be the primary management utility for DTCs, since it would be independent as to whether MPE/iX or HP-UX systems were being accessed by the DTCs. With this decision, a greater level of functionality was added to the OVDTCMGR utility, including the ability to specify X.25 PAD/System-to-system switching information, routable AFTP support and Telnet Access Card support. Users wanting this functionality had no choice but to use the OVDTCMGR as their DTC management platform.

Also, in complex networks, the OVDTCMGR provides an option to managing DTCs at remote locations since many of the protocols supported over the DTC are not routable. These HP proprietary protocols are used for connections into MPE/iX systems and form the basis for the serial terminal and printer access used by many MPE/iX customers.

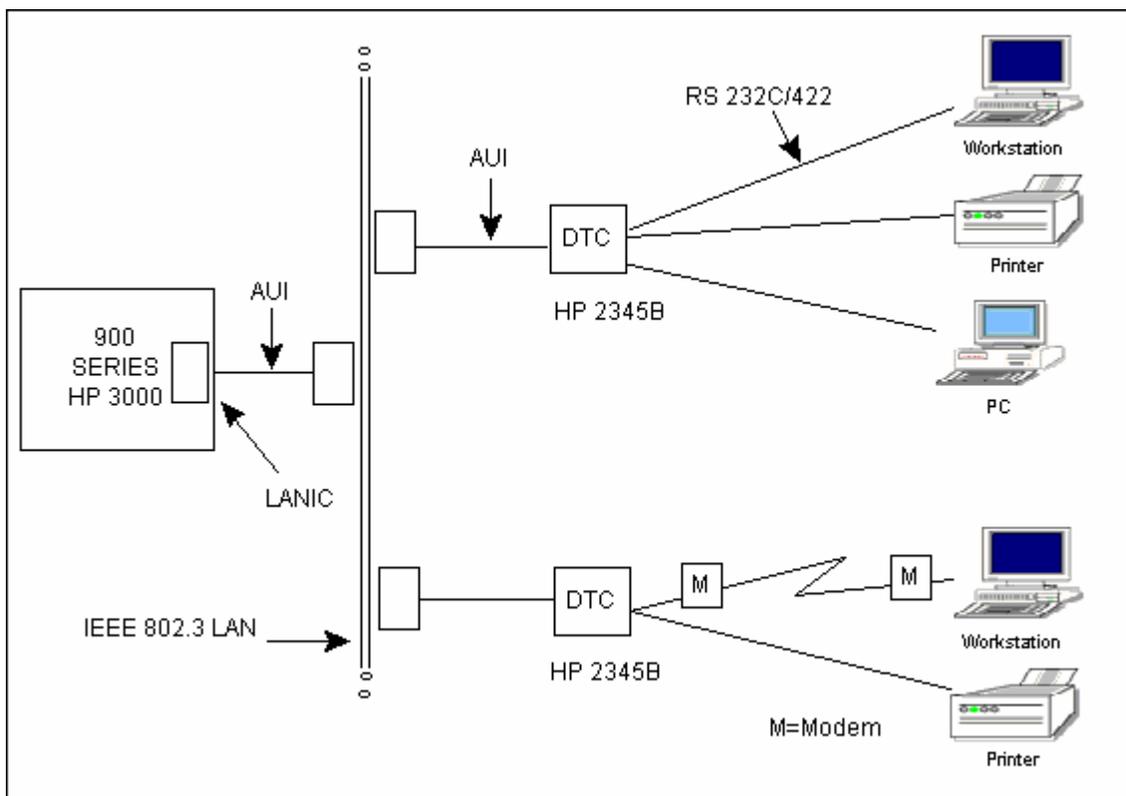
In late 2002, the Workgroup Node Manager module of the OpenView product that runs on top of the Win95/Win98 platform will fall out of support. While the OVDTCMGR product will still be supported, the underlying OpenView software for the Win95/Win98 platform will not. A project is currently underway within the MPE/iX lab to enable the MPE/iX NMMGR management tool to support all current DTC functionality, including enhanced X.25 system-to-system/PAD switching, Routable AFTP and the Telnet Access Card. At the completion of this project, NMMGR DTC configuration functionality will be identical to the OVDTCMGR program. At the writing of this paper, much of this project has been completed and is in the test phase. This white paper will outline different options for remote management of DTCs with advantages and disadvantages specified for each.

2. Detailed Problem Statement

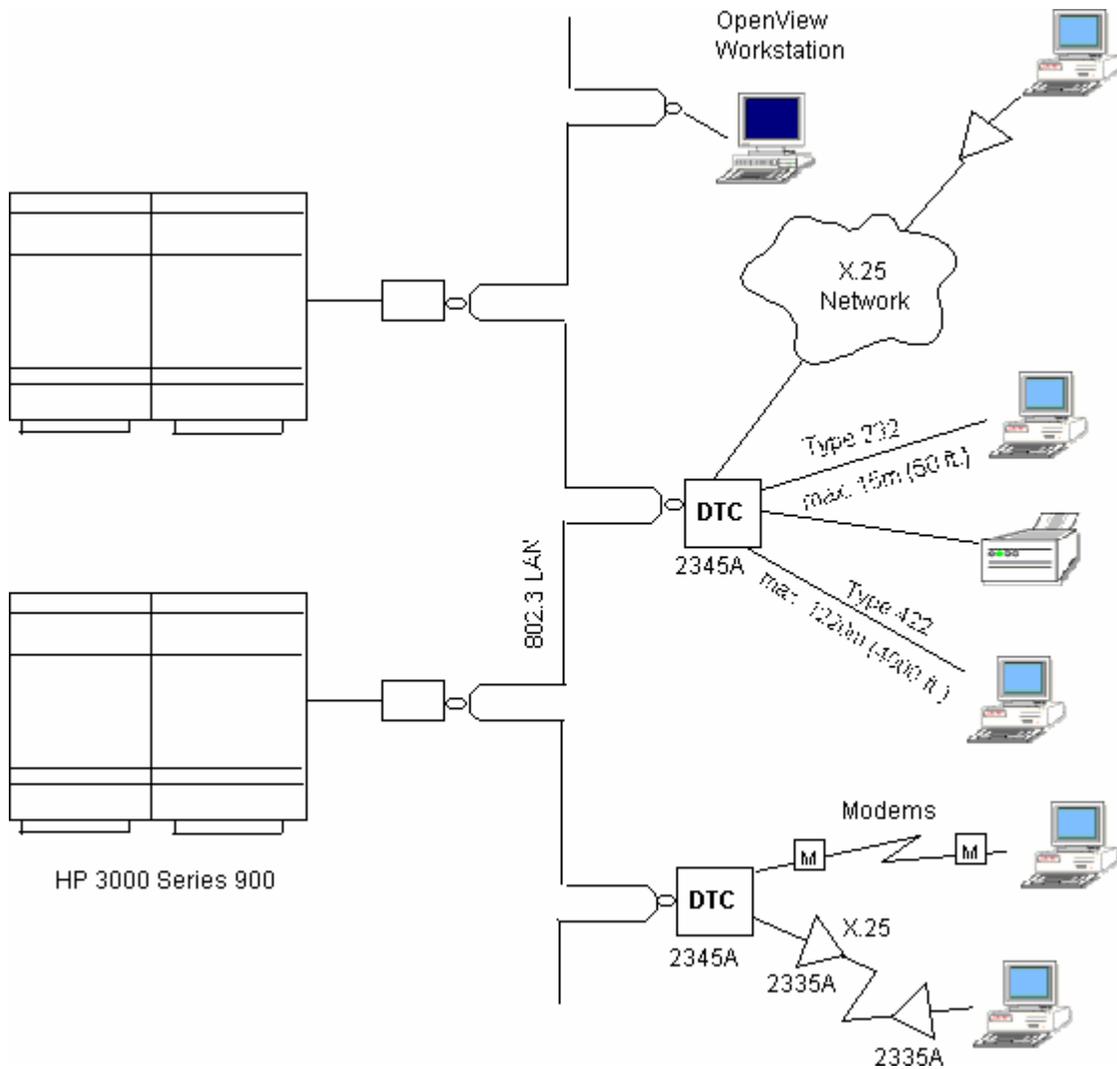
When the DTC product was first developed, its intention was focused on provided serial printer and terminal access to an MPE/iX system via a networked

connection. It was envisioned that this product would reside in the computer room, next to the CPU with a simple 10 Mbit connection running between the system and the DTC. A simple, lightweight, proprietary protocol was developed that would enable the user to make networked connections between the DTC and a serial device. These protocols, the Avesta Flow Control Protocol (AFCP) and the Avesta Device Control Protocol (ADCP) had the advantage of being designed for and with the DTC in mind, so they were highly efficient and produced excellent throughput. However, these protocols were designed for simple networking architectures and did not include any mechanism for routing.

The following diagram outlines a simple DTC network, as envisioned by the original design team:



In this network diagram, the HP 3000 is attached to a network with 2 DTCs that is connected with various serial devices, including terminal, printers and serial modems. This is what was typically available after the 1.1 release of the MPE/iX operating system. However, due to customer feedback and industry trends, it became apparent that this functionality was not going to be sufficient and so starting at MPE/iX release 2.0 and beyond, additional functionality was added, including X.25 system-to-system and PAD support, Telnet Access Card support and multi-system switching support. In order to accomplish this, the OVDTCMGR management platform was developed. With this added functionality support, the possible network diagram evolved into the following example:



With this added complexity came the ability to have DTCs stationed at remote locations with the DTCs managed by an inexpensive PC that could be shared with other activities in the remote office. This allowed the management platform to be leveraged from existing equipment, but it also required that access be given to somebody either at the remote office or setup for dial in access in order to have control of the remote office DTCs.

With the decision to discontinue the OVDTCMGR platform, the method of managing remote DTCs needs to change. It is required, that a solution be put in place that continues the capability of managing DTCs remotely. If not, then some DTC customers will realize a severe impact to their ability to continue their production computing activities. The following options present alternatives for remote management of DTCs.

3. Options

3.1. Option 1: Status Quo

In this option, the user decides to continue using the OVDTCMGR platform at their remote sites.

3.1.1. Advantages

In this scenario, no changes are required at all by the customer. Current configurations remain the same and the customer continues using the same tasks and processes that have already been established in order to manage the use of their DTCs. The customer's users who connect via the DTC see no difference in their connection mechanism or ability.

3.1.2. Disadvantages

The greatest issue with this option is that the customer will now be using a product that has a component that is no supportable. While it is true that this component has been stable and has not been a central cause of a problem in several years, there is an inherent risk in using an unsupported product that will be unacceptable to many MPE/iX customers. It is also possible that given the decision to not support part of the OPENVIEW platform, may impact the ability of the CSY team to deliver any OVDTCMGR changes in a timely manner. While it is true that an end-of-life date has been established for the HP3000 and the DTC, there is still functionality that could possibly be added to the DTC family, albeit being minor.

3.2. Option 2: HP-UX Management

In this option, the customer moves management of the DTC from the OPENVIEW platform to the HP-UX platform running the DTCMGR/UX utilities.

3.2.1. Advantages

If the customer has an existing HP-UX system on its network, than this system can be used to manage the DTCs, avoiding the need to buy any extra hardware to replace the OVDTCMGR PC. Also, since the HP-UX utilities are based on ARPA standard protocols, the DTCs can be managed from any system on the network and no special networking configuration is needed to allow access to the DTCs.

3.2.2. Disadvantages

If the customer doesn't have an existing HP-UX on its network, than an HP-UX system would need to be purchased, resulting in an extra cost for the customer. Also, the functionality that is supported on the HP-UX DTC management platform is a subset of what is supported in MPE/iX. Primarily, because of a different ability to make connections via X.25, the HP-UX management platform doesn't allow the configuration of this functionality on DTCs. Customers with a need for X.25 connectivity would not be supported. As well as limited functionality, the methods of connectivity could be potentially different. Users wishing to still make connections via the proprietary AFCP protocol may encounter problems as HP-UX systems rely on Telnet. MPE/iX does support Telnet on its systems since release 5.5, but not to the extent that HP-UX does with regards to user programs connecting to external devices. MPE/iX Telnet is only for inbound, client-initiated connections. Customers wanting to consider this method would have to include a non-trivial test cycle to ensure they can continue to connect to the MPE/iX system in a way that is compatible with their needs. There would also be a potential learning curve for the customer in order to use the HP-UX DTC management utilities, especially if these utilities were not needed in the computing environment.

3.3. Option 3: Local MPE/iX Management

In this option, the OVDTCMGR PC that is at the remote DTC(s) site is replace with a low end MPE/iX box that is focused solely on managing the DTCs. Since the MPE/iX DTC management software is being updated to support all functionality currently supported on the OVDTCMGR PC, no drop off of functionality would be experienced.

3.3.1. Advantages

On customer sites that have DTCs to serve MPE/iX systems, the learning curve for this solution would be small, as familiarity with the NMMGR configuration program would be present. Also, this MPE/iX system would be available for other tasks on the network and not limited to DTC management, given the customer an additional computing resource.

3.3.2. Disadvantages

It is projected that even a low-end HP 3000 system would cost several times as compared to an equivalent low-end Windows 98 based PC that a user could setup to manage the DTCs on the network. If the customer has a large number of remote sites, each

site requiring their own DTC management system, the cost factor alone would become prohibitively expensive. Also, if the site only contained DTCs connecting to HP-UX systems, than this solution would also add a steep learning curve to the additional cost factor.

3.4. Option 4: Bridge/Router Configuration

In this option, the existing networking equipment used to connect the remote site to the main HP 3000 location would be configured to bridge MPE/iX DTC traffic. This would allow the normal connection and management activities to occur between the local and remote site and would be transparent to the remote users.

The following is an example of how to do this. The message below was received as a question to an on the HP Networking Forum and contains a response on how to do this over Cisco equipment. The key in the message is filtering and bridging the traffic with the XSAP designation of F8F8 or FCFC. This is the DTC TIO XSAP for DTC connections and DTC management. Configuring the bridging functionality to filter on this will capture the DTC traffic. Other traffic will simply be routed as normal.

author	subject: Cisco routing w/ HP DTC/ AFCP etc...
Michael Nesteriak	<p>April 06, 2000 06:48 AM GMT</p> <hr/> <p>I am changing our old routers over to new Cisco's. The problem I am having is the lack of the lack of HP's AFCP routing capability. I dug up an ARP PROBE (assigned to an interface) command for the Cisco. Any comments/ suggestions regarding this? We cut over next Saturday and this MUST be smooth.</p> <p>Any advice would be greatly appreciated.</p>

Note: If you are the author of this question and wish to assign points to any of the answers, please login first. Click [here](#) for more information on assigning points.

Sort Answers By: Date or [Points](#)

Michael Nesteriak	<p>April 24, 2000 13:40 PM GMT [N/A]</p> <hr/> <p>I think we have fixed this. I HIGHLY recommend doing this on a downed interface. We experienced complete interface shutdowns after attempting this. DON'T DO IT LIVE!!</p> <p>Cisco IOS 12.0 (6) commands...</p> <pre>configure terminal bridge crb bridge 1 protocol ieee bridge 1 route ip</pre> <p>Then apply the bridge-group 1 to BOTH sides of the bridged interfaces.</p>
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This takes everything on the segments and bridges it except ip (it routes ip). Great way to find out what is on your WAN.

TO LOCK IT DOWN TO ONLY THE DTC EQUIPMENT...

```
configure terminal
access-list 200 permit 0xf8f8 0x0000
access-list 200 permit 0xfcfc 0x0000
```

Now apply the access-list to the interface where the DTC's come into...

```
configure terminal
int eth x\x
bridge-group 1 input-lsapi-list 200
```

This turns the bridge group access-list into a filter for only the protocol type required by the DTC's. Do this on both sides of the WAN link.

Much thanks to Scott M. at Cisco for coming up with this!

3.4.1. Advantages

By bridging the DTC traffic to the remote site, the customer eliminates the need to have an OVDTCMGR PC or another piece of equipment at a remote location. All DTC management is centralized at a main IT center. Given that the NMMGR program is being enhanced to support all functionality currently configurable on the DTC, no drop off of functionality would be noticed. Also, problem resolution and data collection would be more consistent as this would be done from one location with a single tool, instead of requiring information from both the system based tools and the OVDTCMGR utility. This would also free up the need to have trained staff at every remote location to monitor and use the OVDTCMGR or require the need to have remote access to the OVDTCMGR PC. It also removes the OVDTCMGR PC as being a point of failure at the remote location and establishes the capability of having several MPE/iX systems capable of managing the same DTC farm. If one of the MPE/iX systems goes down, the others could be configured quickly to take over management of the DTCs, while a failure of the remote OVDTCMGR PC would render that remote site dead until a new PC could be brought up on a new PC, requiring a trip to the remote site with a new PC or expertise at the site to setup the new PC. With trends pointing at centralization of IT staffs, this possibility is not ideal.

3.4.2. Disadvantages

Depending on the type of equipment linking the remote site with the local HP 3000 system, it may require an upgrade or purchase of new equipment. Most newer switches and routers from known companies as HP and Cisco have the capability of bridging traffic across routers so no routing capability is required in the networking protocol. If the router is an older model, this may not be capable

and an upgrade may be needed. It is also possible, that the remote networking layout may be architected in a way that the DTC management traffic over the network takes too long to reach the HP 3000, causing the HP 3000 management tools to fail the management of the DTC. If this occurs, the MPE/iX lab would need to investigate and provide a patch that would address this issue. There is also the potential that IT staff would need to have updated training in the use of the routers in order to make this configuration change. While most router functionality is self evident out of the box, having to specify bridging of specific packets would be more complex, leading to a potential increase in configuration problems and more support calls.

4. Recommendations

Each option presented above is a potential solution for each customer, depending on the circumstances and the customer's environment. However, it is thought that open 3.4 Bridge/Router Configuration offers the least intrusive method of keeping configurations while still using supported method. Since all of the NMMGR configuration and management functionality is controlled within the CSY lab, there is no danger of losing support for this solution. By also adding full functionality to this product, there is no loss of connection methodologies, which keeps the environment transparent to the end users. Plus, the ability to manage the remote locations from a central system provides more control for the IT staff to manage DTCs and address problems if that occurs. Failure of the networking equipment connecting the remote site is not an issue, as normal connections to the DTCs would be lost anyway, something that the OVDTCMGR solution cannot prevent. It is thought that solution 3.4 is the cleanest solution and provides the most capability for support as the end of the HP 3000 draws near.