TEAM Version 1.2.0

Release Notes, Version 1.2.0 for HPOV - SUN Solaris

058R927-V120, Issue 3 - March 2001

General DataComm
Network Access Division

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Section 1 - HP Open View on Solaris

1.0 Overview

These installation and release notes provide new information relevant to the T1/E1 (TEAM) V1.2.0 software product. This updates the information supplied by the ***T1/E1 Operating and Installation Manual.*** If you require additional details please refer to that manual.

Team Version 1.2.0 is now supported on the following Solaris platforms: Solaris 2.7 with HPOV 6.1 and Solaris 2.8 with HPOV 6.1. For the latest product information, check the GDC website at **`http://www.gdc.com`** or your GDC field representative.

2.0 Software Reference

Throughout this manual, short forms of the software product names will be used. The following table provides reference information for all software modules relevant to TEAM V1.2.0 for Solaris installation.

Table 1: Software Reference for Solaris

Item	Part Number	Version / Release
T1/E1 (TEAM) Software Product	058U607-C01A	Ver 1.2.0
T1/E1 Operation/Installation Manual	058R693-V111	Latest Issue
Solaris Software Product	S-058U019-C01	Ver 2.7 / Nov 1999
	S-058U020-001	Ver 2.8 / Feb 2000 (Ver A)
HPOV for Solaris Software Product	Full 759-065S002 Entry 759-065S003	Ver 6.1
Solaris/HPOV Patch Clusters	Ref: Sun / HPOV websites	
HPOV Network Node Manager Performance and Configuration Guide	HP J1170-99002	Latest Release

3.0 Improvements Since Last Release

This is the initial release of TEAM V1.2.0 software. This software has been tested to be Year 2000 compliant in accordance to GDC ENG-STD-003. Check GDC's web site at http://www.gdc.com for the latest Year 2000 information. Note the following new information concerning this software:

- The application is approved for operation on SUN Solaris 2.7, Solaris 2.8, HP OpenView 6.1 and HPUX 11.0 upgrades.

TEAM V1.1.1-PATCH

- The TEAM map application now checks to see if the TEAM alarm generator application is running. A pop-up is displayed if the TEAM alarm generator is not running.

TEAM V1.2.0 RELEASE

- In TEAM Functions->Configure Network, Configure Network now supports up to 40 nodes.

Note: *Firmware revision "F" or greater must be installed in the DMA-200 if you require more than 20 nodes.*

- In TEAM Functions->Configure Network, some window field labels have been changed as follows:

OLD LABEL	NEW LABEL
Node	Ckt/Node
Telephone Number	Identifier/Phone

- In TEAM Functions->Network Access, the Status Bar displays proper Terminal Synchronization (TSY) status. When synchronized, the status LED is dark green.

4.0 HP OpenView for Solaris

The following sections describe the current requirements and procedures concerning the HP OpenView for Solaris version of TEAM V1.2.0 software.

4.1 Hardware Requirements

The current hardware requirements for TEAM V1.2.0 software is as follows:

- Minimum disk space requirements:

  `/opt` 60 megabytes

- The graphics card should support a resolution of 1152x900
- SUN ULTRA 5 or greater with a minimum of 96 megabytes of RAM, 2 gigabytes of hard disk space, 350 megabytes of disk space and 192 megabytes of swap space.
- CD ROM Drive

Note: *For information on hardware requirements for HP OpenView Network Node Manager products, refer to the HP OpenView Network Node Manager Products Installation Guide.*

4.2 Software Requirements

Before installing this version of TEAM, the following software must be installed. Refer to Table 1: Software Reference for Solaris, for detailed identification of all software products discussed below.

- Solaris Software
- HP OpenView for Solaris, Entry *or* HP OpenView for Solaris, Full
- TEAM Ver 1.2.0 software package

Note: *IMPORTANT - It is highly recommended that the customer download and install the latest SOLARIS PATCH CLUSTER from the following Sun web site: http://sunsolve.sun.com. This will ensure that you have updated the Operating System along with any current fixes to reported problems.*

Note: *IMPORTANT - It is highly recommended that the customer download and install the latest HP OPENVIEW CONSOLIDATED PATCH CLUSTER from the following HP web site: http://ovweb.external.hp.com/cpe/patches. This will ensure that you have updated HP OpenView along with any current fixes to reported problems.*

4.3 First Time Installation

To install the current TEAM V1.2.0 software,

1. Make sure that all users exit HP OpenView for Solaris.
2. Insert the TEAM V1.2.0 Compact Disk into the CD ROM drive.
3. At a shell prompt become super-user by entering the following command:

   `su`
4. To stop HP Open View, type:

   `opt/OV/bin/ovstop`
5. Start the installation process by entering the following commands:

   `cd /cdrom/cdrom0`
6. If a version of the TEAM V1.2.0 is already resident on the workstation, or if you are not sure if it is resident, enter the following command before attempting to install the new version:

   `./remove`

   Ignore any error messages that may appear and answer **`y`** for the questions.
7. Continue the installation process by entering the following command:

   `./install`

   Answer **`y`** for the questions. The loading of software will take a few minutes.
8. Start HP Open View by typing:

   `/opt/OV/bin/ovstart`
9. Exit super-user (type **`exit`**).
10. Remove the CD from the CD ROM drive.
11. Edit the **`$HOME/.dtprofile`** file to remove the leading pound signs(s) in the line that contains

    `###DTSOURCEPROFILE=true`
12. Update each HP Open View user's environment by changing your environment scripts (with *textedit* or your favorite editor) as follows:

    C (csh) Shell users - add the following lines to #HOME/.cshrc:

    ```
    source /opt/OV/bin/ov.envvars.csh
    set path=($path $OV_BIN)
    source $OV_CONF/cshrc.ENmacs_TEAM
    ```

    Bourne (sh) and Korn (ksh) Shell users - add the following lines to #HOME/.profile:

    ```
    . /opt/OV/bin/ov.envvars.sh
    PATH=$PATH:$OV_BIN;export PATH
    . $OV_CONF/profile.ENmacs_TEAM
    ```

    These updates do not take effect until you log out and log back in.
13. Start HP Openview by typing:

    `/opt/OV/bin/ovw &`

4.4 Installing in a Solaris Distributed Environment

A distributed environment consists of three types of workstations. Not all workstations require installation of all software, but the workstations must be set up in the following order:

A. Collection Station (N/A for TEAM V1.2.0 product)

B. Management Station

C. Management Console

The procedures for TEAM Core and product software installation vary depending on the type of workstation. Perform the installation and set up procedures for each workstation in your distributed environment.

4.4.1 Installing TEAM Applications on the Management Station

To install TEAM on the Management Station, perform the following steps:

1. Make sure all users exit HP OpenView for Solaris.
2. To install TEAM software, insert the TEAM CD into the CD ROM drive.
3. At the shell prompt, become super user by typing

   `su`
4. Check **`/`** to make sure there is a **`/cdrom`** directory already present. If not, create it.
5. Stop HP OpenView processes by typing

   `/opt/OV/bin/ovstop`
6. Start the installation process by typing:

   `cd /cdrom/cdrom0`
7. If a version of the TEAM is already resident on the workstation, or if you are not sure if it is resident, enter the following command before attempting to install the new version:

   `./remove`

   Ignore any error messages that may appear on the monitor and answer **`y`** for the questions.
8. Continue the installation process by entering the following command:

   `./install`
9. Answer **`Y`** to the questions.
10. When installation is complete, start HP OpenView processes by typing:

    `/opt/OV/bin/ovstart`
11. Type **`cd /`**
12. Type **`eject`**
13. Exit super user by typing **`exit`**. Remove the CD from the CD ROM drive.

4.4.2 Setting Up the Management Station

1. At the shell prompt, become super user by typing

   `su`

2. Type the following commands:

   `/opt/OV/bin/ovstop`
   `/etc/init.d/nfs.client stop`
   `/etc/init.d/nfs.server start`

3. To ensure the NFS server daemon process **`nfsd`** is running, type the following command and verify the results:

   `ps -ef | grep nfsd`

4. To add all Management Consoles to the management station, edit the **`/etc/hosts`** file by typing each Console's specific IP address and Hostname on a separate line, as shown in the example:

   `###.###.###.###` *Console_Hostname*
   `###.###.###.###` *Console_Hostname*

5. Save and close the **`/etc/hosts file`**.

Note: *If using vi editor, use* **`wq!`** *to save and close the file.*

6. For the Management Console system to share the management station directories over NFS, edit **`/etc/dfs/dfstab`** file as follows:

   `share -F nfs -o root=`*Console_Hostname* **`/etc/opt/OV/share`**
   `share -F nfs -o root=`*Console_Hostname* **`/var/opt/OV/share`**
   `share -F nfs -o root=`*Console_Hostname* **`/usr/tmp`**

7. Save and close the **`/etc/dfs/dfstab`** file.

8. To share the Management Station directories with the Consoles over NFS, type:

   `share -F nfs -o root=`*Console_Hostname* **`/etc/opt/OV/share`**
   `share -F nfs -o root=`*Console_Hostname* **`/var/opt/OV/share`**
   `share -F nfs -o root=`*Console_Hostname* **`/usr/tmp`**

9. Edit the **`/etc/opt/OV/share/conf/ovwdb.auth`** file as shown below to add an entry for the Console, as shown in the example:

   Console_Hostname **`+`**

10. Edit the **`/etc/opt/OV/share/conf/ovw.auth`** file as shown below to add an entry for the Console, as shown in the example:

    Console_Hostname **`+`**

Note: *Repeat step 6 through step10 using the specific hostname for each additional Management Console in the system.*

11. Type the following command to restart nfs server:

    `/etc/init.d/nfs.server stop`
    `/etc/init.d/nfs.server start`

12. To start HP Openview processes, type:

    `/opt/OV/bin/ovstart`

13. Exit super user by typing **`exit`**.

14. Complete the setup by typing:

    `/opt/OV/bin/ovw &`

4.4.3 Installing TEAM Applications on Management Consoles

To install TEAM software on Management Consoles, perform the following steps:

1. Make sure all users exit HP OpenView for Solaris.

2. On the Management Console, become a super user by typing:

   `su`

If the Solaris distributed environment has been set up, perform steps 3- 7. Otherwise, skip to step 8.

3. Disconnect as a HP OpenView client by running:

   `/opt/OV/bin/ovwsetupclient -u`

4. Open the file **`/etc/vfstab`** and type a **#** in the beginning of each line to comment them out. Save and close the file.

5. On the Management Station, become a super user and open the **`/etc/dfs/dfstab`** file. Comment out each line which contains the Console hostname by typing a **#** in the beginning of each line.

6. Save and close the **`/etc/dfs/dfstab`** file.

7. On the Management Console become a super user and enter the following commands:

   `/etc/umount` *Station_Hostname***`:/etc/opt/OV/share`**
   `/etc/umount` *Station_Hostname***`:/var/opt/OV/share`**
   `/etc/umount` *Station_Hostname***`:/usr/tmp`**

8. Check **`/`** to make sure there is a **`/cdrom`** directory already present. If not, create it.

9. Stop HP OpenView processes by typing

   `/opt/OV/bin/ovstop`

10. Insert the TEAM Core Compact Disk into the CD ROM drive.

11. Start the installation process by typing:

    `cd /cdrom/cdrom0`

12. If a version of the TEAM is already resident on the workstation, or if you are not sure if it is resident, enter the following command before attempting to install the new version:

    `./remove`

Ignore any error messages that may appear on the monitor and answer **y** for the questions.

13. Continue the installation process by entering the following command:

    `./install`

14. Answer **`Y`** to the questions.

15. When installation is complete, start HP OpenView processes by typing:

    `/opt/OV/bin/ovstart`

16. Type **`cd /`**

17. Type **`eject`**

18. Exit super user by typing **`exit`**. Remove the CD from the CD ROM drive.

Perform steps 19 - 25 only if the Solaris distributed environment has been set up. Otherwise, skip to step 26.

19. On the Management Station become a super user by typing:

    `su`

20. Open the **`/etc/dfs/dfstab`** file. Remove the **#** in the beginning of each line which contains the Console hostname.

21. Type the following commands:

    `share -F nfs -o root=`*Console_Host_Name* **`/etc/opt/OV/share`**
    `share -F nfs -o root=`*Console_Host_Name* **`/var/opt/OV/share`**
    `share -F nfs -o root=`*Console_Host_Name* **`/usr/tmp`**

Note: *You will now mount* **`/usr/tmp`** *on the client from the server over nfs, since the TEAM Shelf Discovery process stores the discovered shelf GUI images (gif files) in /usr/tmp.*

22. On the Management Console become a super user by typing

    `su`

23. Open the file **`/etc/vfstab`** and restore each line by deleting the **#** in the beginning of each line.

24. Save and close the file.

25. Type the following commands:

    `/etc/mount` *Station_Hostname***`:/etc/opt/OV/share`**
    `/etc/mount` *Station_Hostname***`:/var/opt/OV/share`**
    `/etc/mount` *Station_Hostname***`:/usr/tmp`**
    `/opt/OV/bin/ovwsetupclient /opt/OV/nfs/`*Station_Hostname*

Note: *The path many be different if automounter was used.*

26. Exit super user and become a normal user. On the management console, bring up the OpenView windows using the server database by typing:

    `/opt/OV/bin/ovw &`

4.4.4 Setting Up the Management Console

1. At the shell prompt, become super user by typing

   su

2. Type the following commands

   /opt/OV/bin/ovstop
   /etc/init.d/nfs.server stop
   /etc/init.d/nfs.client start

3. To ensure that the NFS client daemon processes (statd and lockd) are running, type the following command and verify its results:

   ps -ef | grep statd
   ps -ef | grep lockd

4. To add the Management Station to the Management Console, edit the **/etc/hosts** file by typing the Management Station's specific IP address and Hostname, as shown in the example:

   ###.###.###.### *Station_Hostname*

5. Save and close the **/etc/hosts** file.

6. Type the following commands:

   mkdir -p /opt/OV/nfs/*Station_Hostname***/etc/opt/OV/share**
   mkdir -p /opt/OV/nfs/*Station_Hostname***/var/opt/OV/share**
   rmdir /usr/tmp
   mkdir -p /usr/tmp
   chmod 777 /usr/tmp

7. To mount the Management Station directories on this Console over NFS, edit the **/etc/vfstab** file as shown in the example:

*Station_Hostname***:/etc/opt/OV/share - /opt/OV/nfs/***Station_Hostname***/etc/opt/OV/share/ nfs - yes rw**
*Station_Hostname***:/var/opt/OV/share - /opt/OV/nfs/***Station_Hostname***/var/opt/OV/share/ nfs - yes rw**
*Station_Hostname***:/usr/tmp - /usr/tmp nfs - yes rw**

8. Save and close the **/etc/vfstab** file.

9. To mount the Management Station directories on this Console over NFS, type the following commands:

   /etc/mount *Station_Hostname***:/etc/opt/OV/share**
   /etc/mount *Station_Hostname***:/var/opt/OV/share**
   /etc/mount *Station_Hostname***:/usr/tmp**

10. Type the following commands to restart nfs client

    /etc/init.d/nfs.client stop
    /etc/init.d/nfs.client start

11. Set up the Management Console by typing:

    /opt/OV/bin/ovwsetupclient /opt/OV/nfs/*Station_Hostname*

12. Exit Super User by typing **exit**.

13. Complete the setup by typing:

    `/opt/OV/bin/ovw &`

Note: *It is not necessary to start HP OpenView daemons using /opt/OV/bin/ovstart on the Management Console because the Console shares the same HP OpenView database present on the Management Station over NFS.*

Note: *If the Console OpenView windows does not start up properly, reboot the Management Station and wait until it is UP completely. Then, reboot the Console.*

4.5 Post-Installation Procedure For All Solaris Environments

Once the TEAM V1.2.0 software has been installed in the desired environment, the following procedure must be performed to enable IP Discovery.

1. After completing installation and environment setup, open the root map.
2. At the Options menu, select **`Network Polling Configuration: IP`**.
3. At the Configuration Area, select **`IP Discovery`**.
4. Enable the **`Discover New IP Nodes`** option by selecting its checkbox.
5. Click **`OK`**. Discovery will begin at once and the Universe map will start to show the discovered shelves.

4.6 Permissions and Licensing

The following procedure should be performed by the super-user (root) prior to starting or using TEAM V1.2.0.

Permissions

Be sure to use an umask setting of 022 when editing TEAM V1.2.0 application configuration files. This will ensure that normal TEAM V1.2.0 users have read permission for application license files, configuration files, etc.

Licensing TEAM

1. Before using the TEAM V1.2.0 you must obtain a software license key from General DataComm. The following information must be provided to obtain a license key:

Host ID:	an 8-character hexadecimal value
Product:	TEAM
Version:	1
Release:	2
Revision:	0
Expiration:	none

2. You will need to supply a host identifier (Host ID) to obtain a license key. At the shell prompt, type the following command to display the workstation Host ID:

   `hostid`

3. Once you have obtained the software license key, you must install the key. Become super-user, then type the following commands at a shell prompt to install the key:

```
touch /opt/OV/app-defaults/GDC.license
/opt/OV/bin/GDC_setkey -s <HostID> TEAM 1 2 0 <Expiration> <License Key>
```

Example:

```
/opt/OV/bin/GDC_setkey -s 02bb3fa8 TEAM 1 2 0 none ZFAUVQML
```

5.0 De-Installation

To remove TEAM software:

1. Make sure that all users exit HP OpenView for Solaris.
2. Insert the TEAM Compact Disk into the CD ROM drive.
3. At a shell prompt, become super-user.
4. To stop HPOpen View, type:

   ```
   /opt/OV/bin/ovstop
   ```

5. Start the removal process by entering the following command:

   ```
   cd /cdrom/cdrom0/
   ./remove
   ```

6. To start all HP Open View, type

   ```
   /opt/OV/bin/ovstart
   ```

7. Exit super-user (type **exit**).
8. Remove the CD from the CD ROM drive.

5.1 De-Installing a Distributed Environment

De-installation of TEAM software in a distributed Solaris environment should be performed in the following order:

A. Management Console

B. Management Station

C. Collection Station (N/A)

Procedures vary, depending on the type of environment. Refer to the appropriate procedures below. Additional information about distributed environments is provided in Section 2.

5.1.1 De-Installing the Management Console

To remove TEAM software from a management console. perform the following steps:

Note: *If the Solaris distributed environment has been set up, it must be disabled temporarily to avoid sharing conflicts with the server. Additional steps for this are provided below.*

1. Make sure that all users exit HP OpenView for Solaris.
2. Insert the TEAM CD into the CD ROM drive.
3. At the shell prompt, become super user by typing:

   `su`
4. Disconnect as a HP OpenView client by running:

   `/opt/OV/bin/ovwsetupclient -u`
5. Stop the HP OpenView processes by typing:

   `/opt/OV/bin/ovstop`
6. Open the file **`/etc/vfstab`** and type a **#** in the beginning of each line.
7. Save and close the **`/etc/vfstab`** file.
8. On the Management Station, become a super user and open the **`/etc/dfs/dfstab`** file. Comment out each line which contains this Console by typing a **#** in the beginning of that line.
9. Save and close the **`/etc/dfs/dfstab`** file.
10. On the Management Console, become a super user and enter the following commands:

    `/etc/umount` *Station_Hostname*`:/etc/opt/OV/share`

    `/etc/umount` *Station_Hostname*`:/var/opt/OV/share`

    `/etc/umount` *Station_Hostname*`:/usr/tmp`
11. Begin the removal process by entering the following command:

    `cd /cdrom/cdrom0`

    `./remove`
12. Restart all HP OpenView processes by typing:

    `/opt/OV/bin/ovstart`
13. Type **`cd /`**
14. Type **`eject`**
15. Remove the CD from the CD ROM drive.
16. Open the **`/etc/vfstab`** file and remove the **#** from the beginning of each line that contains a Console hostname.
17. On the Management Station, become a super user by typing:

    `su`
18. Open the **`/etc/dfs/dfstab`** file and remove the **#** from any lines which contain this Console's name.

19. Type the following commands:

    share -F nfs -o root=*Console_Hostname* **/etc/opt/OV/share**
    share -F nfs -o root=*Console_Hostname* **/var/opt/OV/share**
    share -F nfs -o root=*Console_Hostname* **/usr/tmp**

20. Exit super user by typing **exit**.
21. On the Management Console, become a super user by typing **su** and supplying the super user password.
22. Attach the NFS mounts to the management console, execute the following commands, using the management station's host name:

    /etc/mount *Station_Hostname***:/var/opt/OV/share**
    /etc/mount *Station_Hostname***:/etc/opt/OV/share**
    /etc/mount *Station_Hostname***:/usr/tmp**

23. Exit super user login.

5.1.2 De-Installing the Management and Collection Stations

1. Make sure that all users exit HP OpenView for Solaris.
2. Insert the TEAM CD into the CD ROM drive.
3. At the shell prompt, become super user by typing:

   su

4. Stop the HP OpenView processes by typing:

   opt/OV/bin/ovstop

5. Begin the removal process by entering the following command:

   cd /cdrom/cdrom0
   ./remove

6. Restart all HP OpenView processes by typing:

   opt/OV/bin/ovstart

5.2 Re-Installation

To re-install TEAM software, it is necessary to first perform all the steps in the De-installation procedure. This removes all TEAM packages. You can then repeat the steps of the Installation Procedure described earlier in this chapter. You will not need to repeat the user environment update procedure.

6.0 Known Issues

- **TEAM Functions->Network Access->Performance->1&24 Hour Reports**
  Remote Network Reports are not supported.
- **TEAM Functions->Network Access->Performance->DS0 Diagnostics**
  The current system has application timers for all of the diagnostic tests. The default time-out (30 seconds) is too short for diagnostic test, causing the application to retry the command prior to the DMAs first response. These parameters can be modified in either of two files:

  `/opt/OV/app-defaults/team/team.ini`
  `/opt/OV/app-defaults/C/team/team.ini file`
- **TEAM Functions->Network Access->Performance->DS1/T1 Diagnostics**
  Test Pattern options for **`User Defined`** and **`User Pattern`** are not supported.
- **TEAM Functions->Network Access->Performance->Channel Diagnostics**
  Although Self Test may be selected while in a Digital Loopback test, this operation is not recommended and the results are indeterminate.
- **TEAM Functions->Network Access->Performance DS0/DS1/Channel Diagnostics**
  On the pop up message for a **`No response`**, clicking on the **`Help`** button does the same thing as clicking on the **`OK`** button. In either case, the command is retried.
- **Configuration**
  A Communications Error may occur when changing from alternate DS0's to consecutive DS0's. To avoid this, set the new channel rate by selecting consecutive DS0's and saving to unit. Then select the desired bandwidth and download to the unit.
- **TEAM Functions: Restore Node**
  Attempting to dial with a blank telephone number causes the screen to stay in a "working" mode until a time out occurs.

  The displayed phone number may not match the selected phone number in the scroll list. When the window is first opened the first node in the list is highlighted, however, the phone number displayed at the bottom is the last phone number dialed, not the phone number of the highlighted node.

  If the dial backup attempt fails when restoring a node, the user will not be warned of the failure.
- **TEAM Functions: Master DMAs Configure->Modem Configuration:**

  Intermittently, the Master DMAs Configure window may disappear when the user exits an AT Modem Configuration sub-window in "edit" mode.
- **Solaris 2.7 and Solaris 2.8 Platforms**

  In order to manage TEAM functions, the LAN segment map must display the TEAM icon. However, when a node is discovered for the first time at a management station, a generic symbol is displayed instead of the TEAM icon and TEAM functions appear grayed-out at the Administer menu. To remedy this, perform the following steps:

  A. Click on the generic icon to highlight it.

B. Right-click on the highlighted icon to open the symbol menu, then click on the **`Change Symbol Type`** option.

C. At the Change Symbol Type window, select the TEAM icon for the symbol sub-class.

D. Click **`OK`**.

- **Miscellaneous:**

  TEAM error messages are not logged to the console window on a stand-alone system. Error messages will appear in the window from which HP Openview was started.

  Disabling the Supervisory terminal from the control software is not supported.

  Help windows do not exit upon termination of the application. Explicitly exit all help window prior to exiting any TEAM application.

  During installation “Duplicate value in database for Agent” is reported. This is normal warning message on system upgrading or reinstallation the TEAM product.

- In some TEAM application windows, slight text misalignments may appear. These do not affect the usability or operation of the application.
- On the Front Panel display, some LED labels may appear out of alignment over their associated LEDs. This does not affect the operation of the application.
- Some TEAM applications may display meaningless characters in the application window headings. This is due to a font conflict which can be resolved by typing the following on the command line *before* running **`ovw`**:

  ```
  xrdb -merge /opt/OV/bin/gdc_load_resources
  ```

7.0 Operating Guidelines

- Because the read-only maps are not automatically updated, use **`Map->Refresh Map`** to update the maps.
- After an installation of the TEAM software or a reboot of the system, TEAM applications may take up to one minute to start up, due to the loading of the shared libraries.
- After an installation of TEAM software, the user must enable **`Discover New IP Nodes`** from the root map Options menu in order for shelf discovery to occur.

Section 2 - TEAM Applications and HP OpenView NNM Scalable and Distributed Environments

1.0 Overview

This section briefly discusses the Scalability and Distribution features in NNM and how to integrate/install TEAM applications in a Scalable and Distributed environment. Refer to the HP OpenView Manual, “A Guide to Scalability and Distribution for NNM” for more detailed understanding and concepts.

1.1 Features and Advantages

The Scalable and Distribution features of the HP OpenView NNM provide robust performance over a wide range of network sizes and degrees of complexity.

The Scalable feature gives NNM the potential for handling networks of different sizes in both LAN and WAN environments. To make NNM scalable, the network management work load must be distributed to multiple systems. Then, the Distribution feature improves performance of NNM in large networks by reducing the amount of management traffic over network resources.

Some of the advantages of these NNM features are:

- The Scalable feature of NNM makes it easier to adapt network management for handling new networking landscapes.
- The Distribution feature minimizes the amount of network management traffic. Without this capability, it would be impractical to monitor thousands of nodes from a single workstation.
- Faster response times and better performance as work load is distributed to multiple workstations.
- Shared responsibilities reduces the risk of losing network management data in the event of an unexpected shutdown of the management station.
- One Common network management database (in most cases) for all users, so that modifications of managed nodes would be reflected across the board.

Some drawbacks/trade-offs are:

- Distribution of tasks requires an increased number of computing resources.
- Scalable and distributed environment requires added complexity in setup.

1.2 Theory of Operation

In a Stand-alone environment, all network management tasks are done on a single workstation. In a Distributed environment tasks are handled by multiple workstations: Collection Station (CS), Management Station (MS), Management Console (MC). Depending on network size, structure, geography and trends, one of four deployment models should be chosen: Fully centralized, Centralized hierarchical, Hierarchical, or Co-operative independent.

- Figure 1 demonstrates a Centralized hierarchical model. Refer to the HP OpenView manual for examples of other models and for choosing the model for your needs.
- Figure 2 demonstrates the HP OpenView and TEAM processes and applications that run on the collection station, the management station, and the management console.

1.2.1 The Collection Station

A collection station discovers nodes and forwards this information to the management station. The collection station also monitors (the netmon process) the nodes in its domain and forwards any traps it receives from the managed node (IP device) to the management station. Depending on the number of managed nodes and network structure, there could be more than one collection station. The collection and management stations periodically synchronize node and topology information. Figure 1 shows two collection stations feeding node and topology information to the management station.

1.2.2 The Management Station

The management station processes the node and topology information it receives from the collection stations and stores the information (via ovwdb) in a database. The management station also receives from collection stations the trap information for various managed nodes (ovtrapd process) and stores it. There should only be one management station in a distributed setup so that the node information can be shared by all the users on various management consoles.

1.2.3 The Management Console

The management console is where all the user processes are executed. User interface (application) processes like ovw, xnmevents, xnmsnmpconf are executed here in order to manage the nodes in the management station's database. The Management Consoles should be connected to the Management Station using an Ethernet LAN or a high speed network matching the speeds of LAN. Management Station and the Management Consoles will share the same database by mounting the database over the Network Filing System (NFS).

1.2.4 Permissions

The first network operator to run ovw and launch OpenView screens will have read/write permissions to the database. The rest of the operators will get read-only permissions. Note that read-only screens do not synchronize automatically with changes in network topology or with the addition or deletion of devices to the database. To resynchronize the entire network map, network operators on the management console must manually perform a **`Map -> Refresh Map`** command. All network operators will be able to perform other TEAM Network Management operations, such as Configuration, Provisioning, Diagnostics. Operators must manage a unit in the shelf from only one workstation at a time.

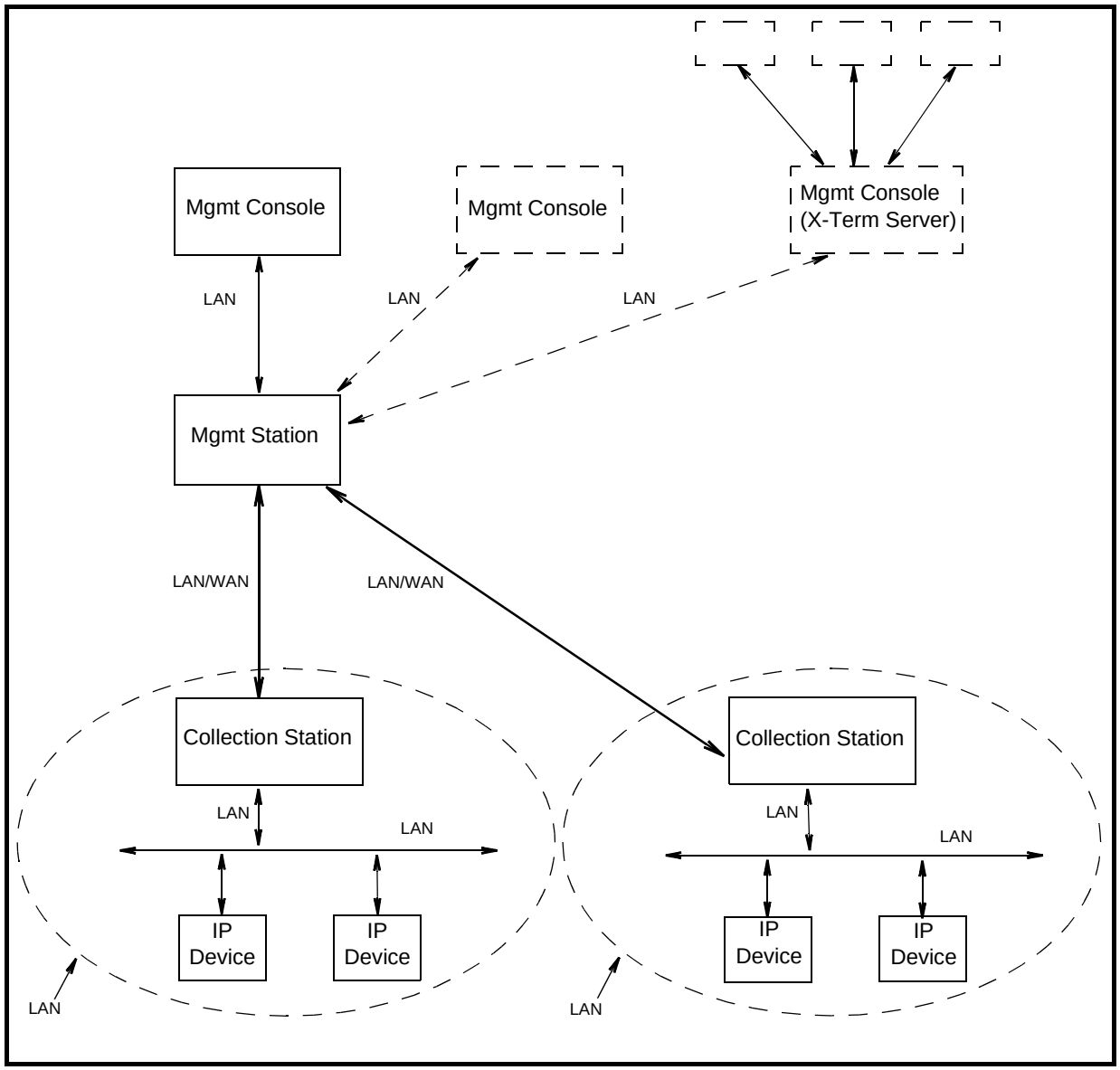

Figure 1: Example of the Centralized Hierarchical Model

1.3 The Distribution of Processes and Applications

The sequence of events that occur end-to-end from the IP node to the management console (Figures 1 and 2) is as follows:

Collection Station(s)

1. **`netmon`** process begins IP discovery, and populates the local topology database(**`ovtopmdb`**) with the help of **`ovtopmd`** process.
2. After the completion of discovery, the topology information is accessible by the management station.

Management Station

3. The management station requests the collection station(s) for topology information via **`ovrepld`** process.
4. Upon obtaining the topology information (from all collection stations), the management station merges the data into its topology database.
5. Using the data in the topology database, the processes in the management station communicate with each node to update other information necessary to manage the node.
6. Periodically, the ovrepld processes on the collection station(s) and management station synchronize the topology data. Once synchronization is complete, only changes in status and topology get sent to the management station.

Management Console and Management Console X Term Server

7. After the management station is ready with node information, the ovw process can be run.
8. Once ovw is up and running, network management on various nodes can be done.

Note: *When one of the management consoles is also designated as a X-Term Server, X-Terminals (such as Tektronics Graphics terminal) could be setup to display ovw sessions on these terminals. The ovw sessions are actually executed on the management console but displayed on the X-Terminals.*

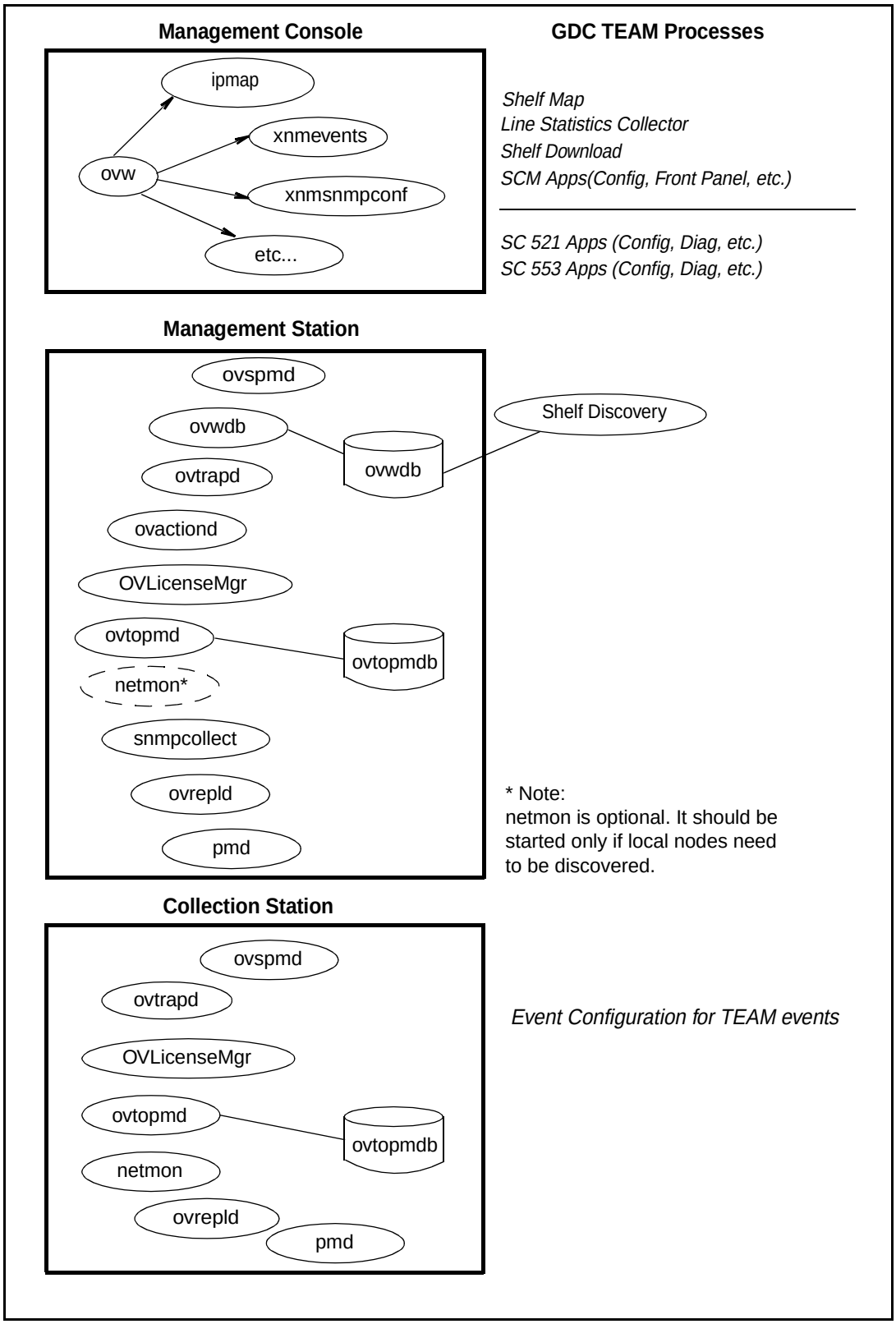

Figure 2: HP OpenView and Team Processes and Applications

2.0 Integrating the TEAM Application in a Distributed Environment

Due to distribution of tasks in a distributed environment, TEAM software products must be installed on the collection station, the management station and the management console in the precise order as described in Sections 2 and 3 of the TEAM Core Release Notes. The following sections describe the dependency tree, discovery, and event handling of GDC devices for TEAM software products.

2.1 TEAM Software Product Dependency

To manage any GDC product using TEAM software, multiple software products are required. Figure 3 shows the dependencies among various products. In the example, the SC521 and SC553 cards along with their associated packages are being managed by TEAM521 and TEAM553. Both TEAM products are dependent upon TEAM Core. Because of this product dependency, TEAM Core must be installed on the workstation *before* installing TEAMSC521, etc.

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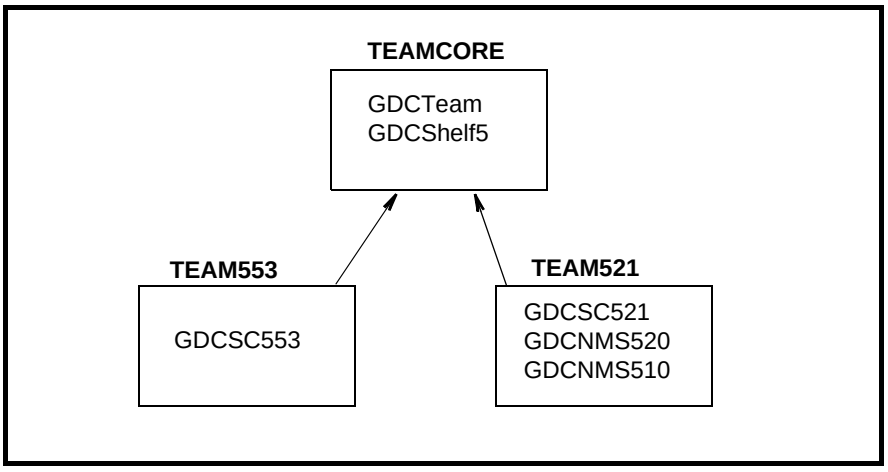

Figure 3: TEAM Software Product Dependencies

2.2 Discovery in an HP OpenView Distributed Environment

Once TEAM software is installed and configured in an HP OpenView NNM distributed environment, the system is ready for network management of GDC devices. This begins with the discovery of a GDC device on the management console where it is managed. Some of the typical applications that are executed on the management console are shown in Figure 2. The sequence of events that occur end-to-end is as follows:

1. A GDC device is discovered by a collection station and gets stored in its topology database.
2. This discovery information is requested by the management station in a synchronization cycle of **`ovrepld`** process.
3. The management station adds the device into its database as a new node.
4. Once a new node gets added on the management station, the **`shelf_discovery`** gets notified of the change.
5. The **`Shelf_discovery`** process communicates with the SCM to get the shelf contents and other relevant information and stores the information.
6. After a GDC shelf is discovered, a new shelf gets added to the TEAM universe submap.
7. From this submap various GDC devices can be managed.

2.3 Event Handling

A trap generated from a GDC device arrives at the management console where it is updated. The sequence of events that occur end-to-end is as follows:

A. When SCM is set up to do so, a GDC device sends a trap to the collection station.

B. The collection station then forwards the trap to the management station, where it gets processed by **`shelf_discovery`** process and notifies the shelfmap process on the management console.

C. The shelfmap process updates the status of the device associated with the event. Note that one process runs for every ovw session.


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