

Install and Configure TPN Server

Objective

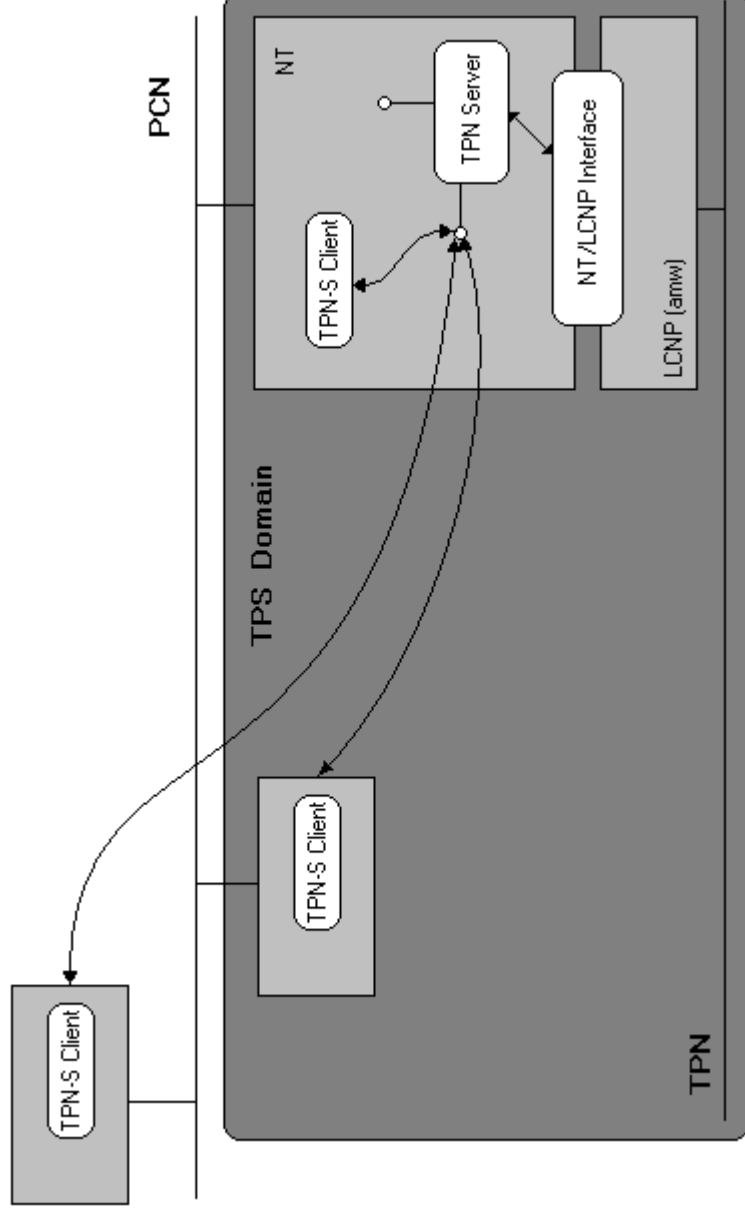
Given a properly configured TPS node, install, configure, and operate a TPN Server on an APP Node.

In This Module

- Overview of the TPN Server
 - Overview of Persistent Cache
 - Overview of the DCOM Infrastructure
 - Overview of Proxy Files
 - Install and Configure the TPN Server
 - Start and Shutdown the TPN Server Using the TPS Status Display
 - Configure the TPN Server for Auto Start
 - Access data from the TPN Server using a GUS Display
-

Install and Configure TPN Server

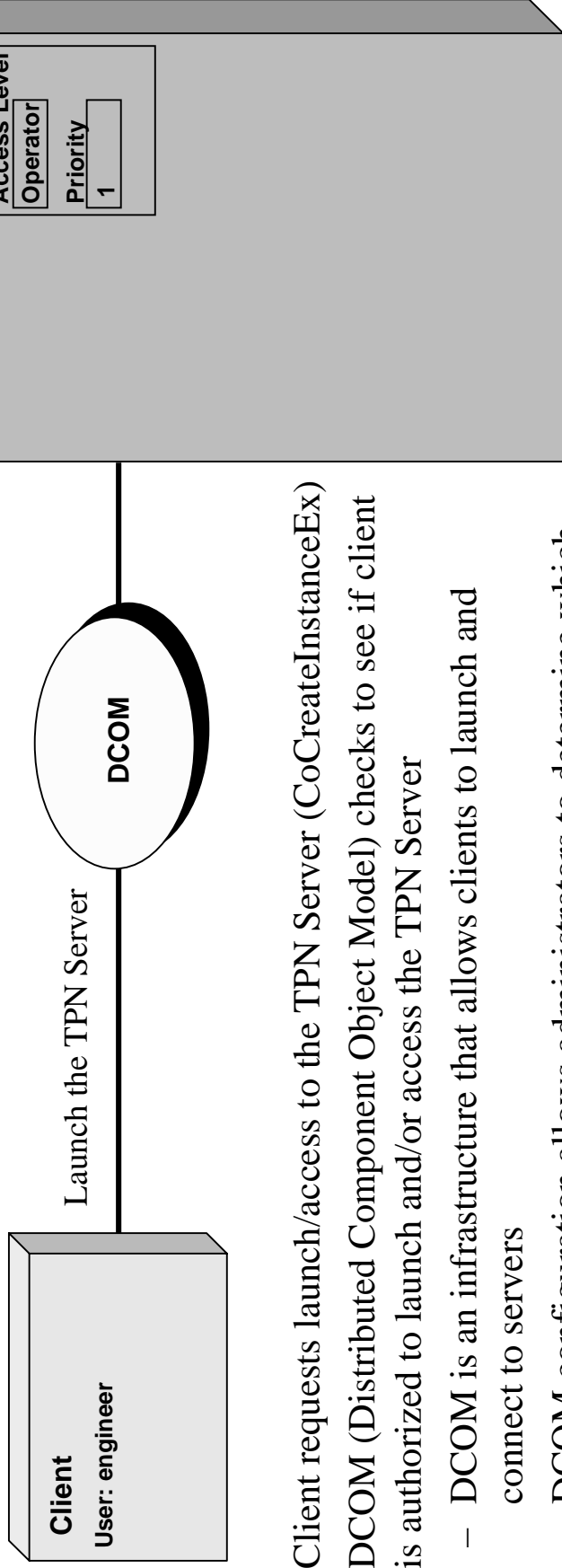
Overview



- Allows client applications to read and write TPN data (point.parameter)
- Data is transferred over open interfaces (OPC)
- Examples of clients
 - **TotalPlant** Batch, GUS displays, RMPCT

Install and Configure TPN Server

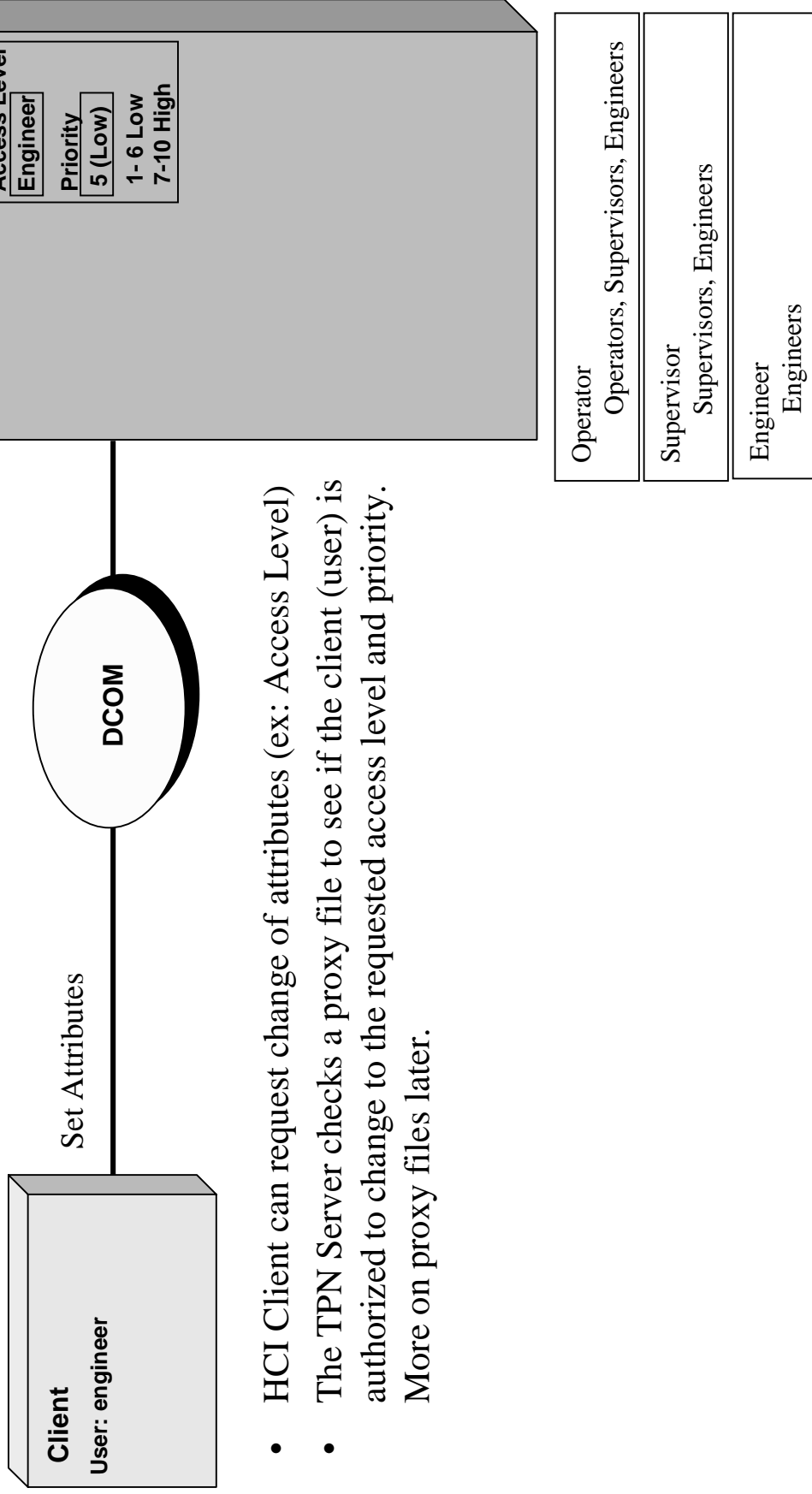
Operation Details



- Client requests launch/access to the TPN Server (CoCreateInstanceEx)
- DCOM (Distributed Component Object Model) checks to see if client is authorized to launch and/or access the TPN Server
 - DCOM is an infrastructure that allows clients to launch and connect to servers
 - DCOM configuration allows administrators to determine which clients are authorized
- TPN Server launched with default attributes

Install and Configure TPN Server

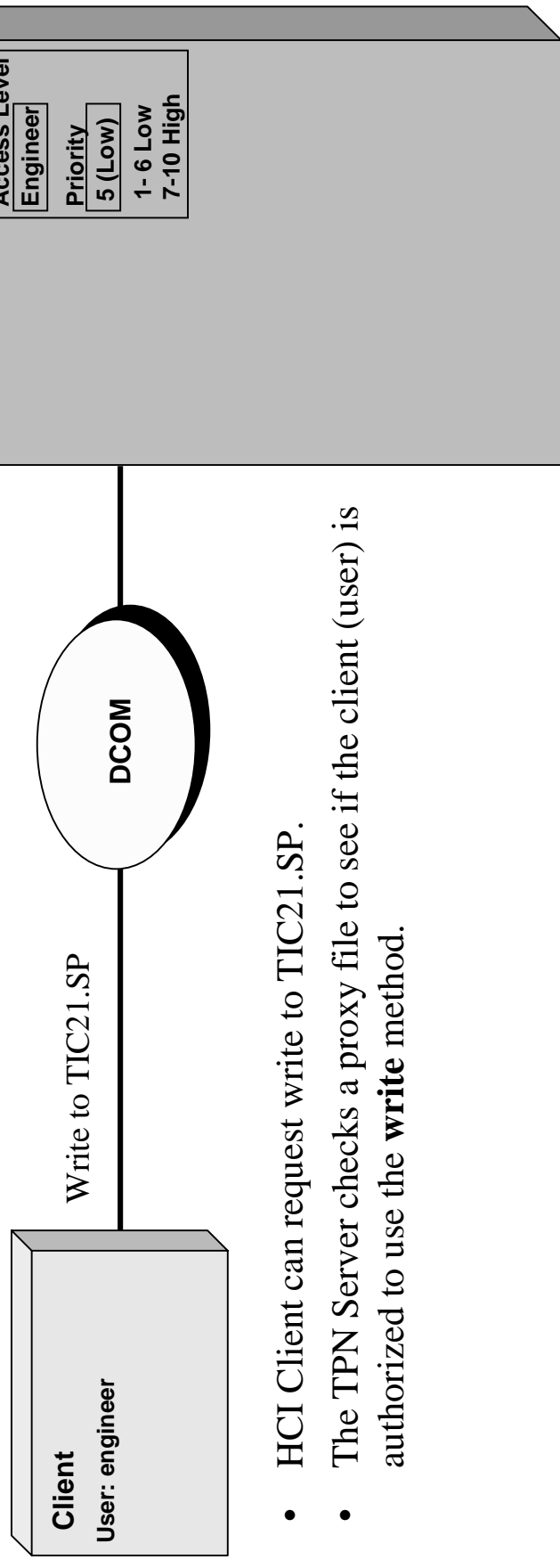
Operation Details



- HCI Client can request change of attributes (ex: Access Level)
- The TPN Server checks a proxy file to see if the client (user) is authorized to change to the requested access level and priority.
More on proxy files later.

Install and Configure TPN Server

Operation Details

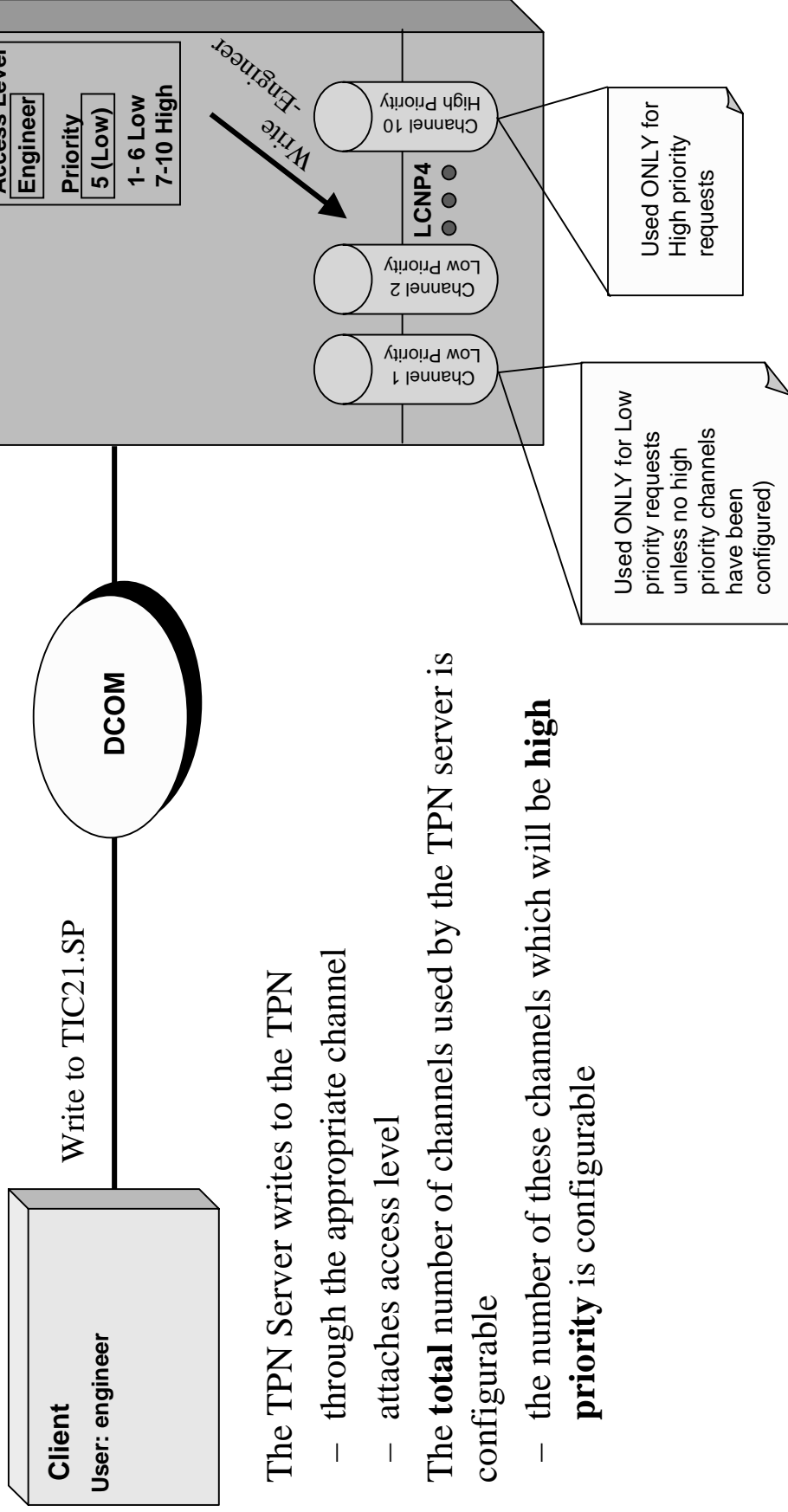


- HCI Client can request write to TIC21.SP.
- The TPN Server checks a proxy file to see if the client (user) is authorized to use the **write** method.

Read	View Only Users, Operators, Supervisors, Engineers
Write	Operators, Supervisors, Engineers
Shutdown	Supervisors, Engineers

Install and Configure TPN Server

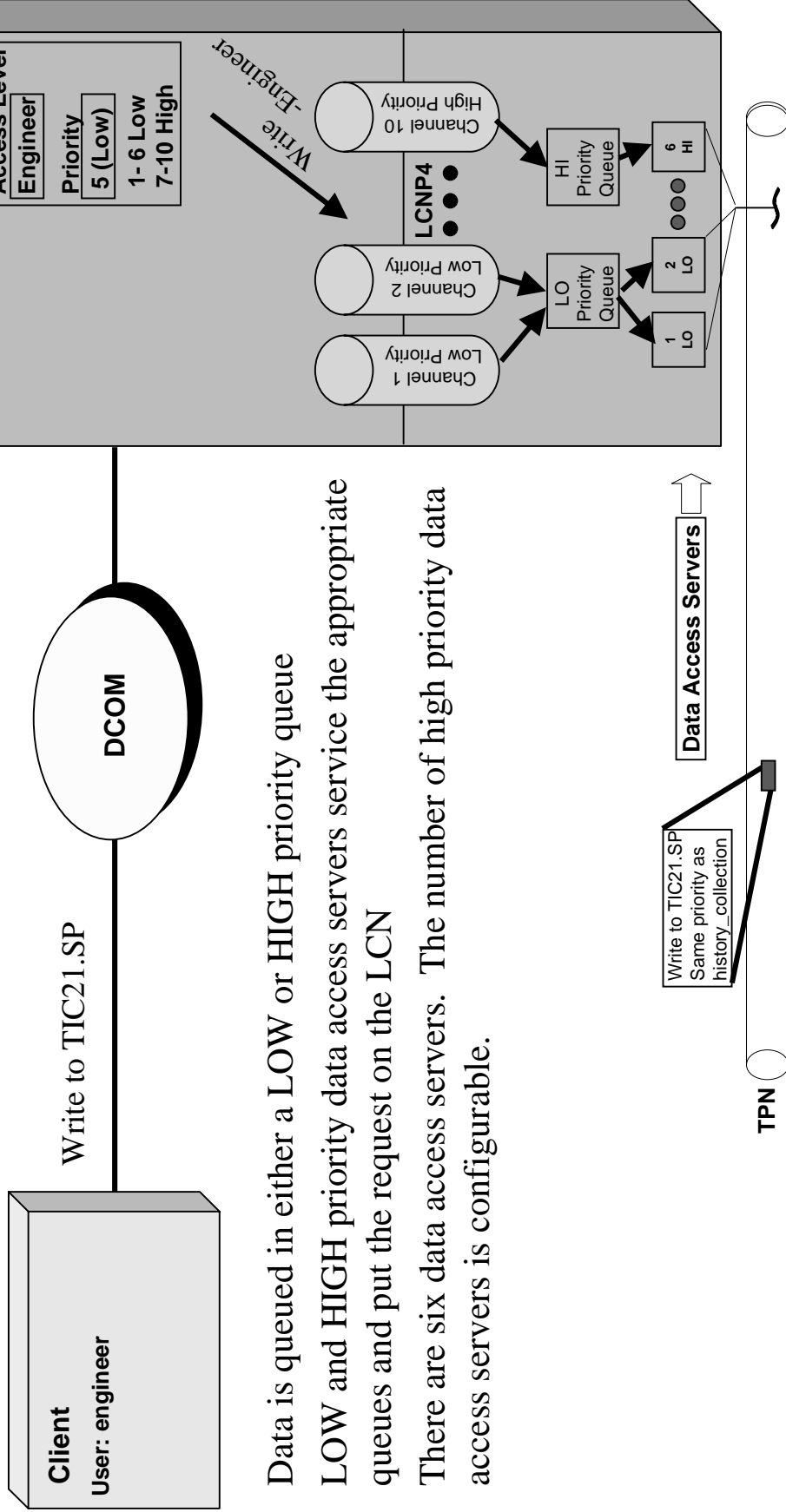
Operation Details



- The TPN Server writes to the TPN
 - through the appropriate channel
 - attaches access level
- The **total** number of channels used by the TPN server is configurable
 - the number of these channels which will be **high priority** is configurable

Install and Configure TPN Server

Operation Details



- Data is queued in either a LOW or HIGH priority queue
- LOW and HIGH priority data access servers service the appropriate queues and put the request on the LCN
- There are six data access servers. The number of high priority data access servers is configurable.

Install and Configure TPN Server

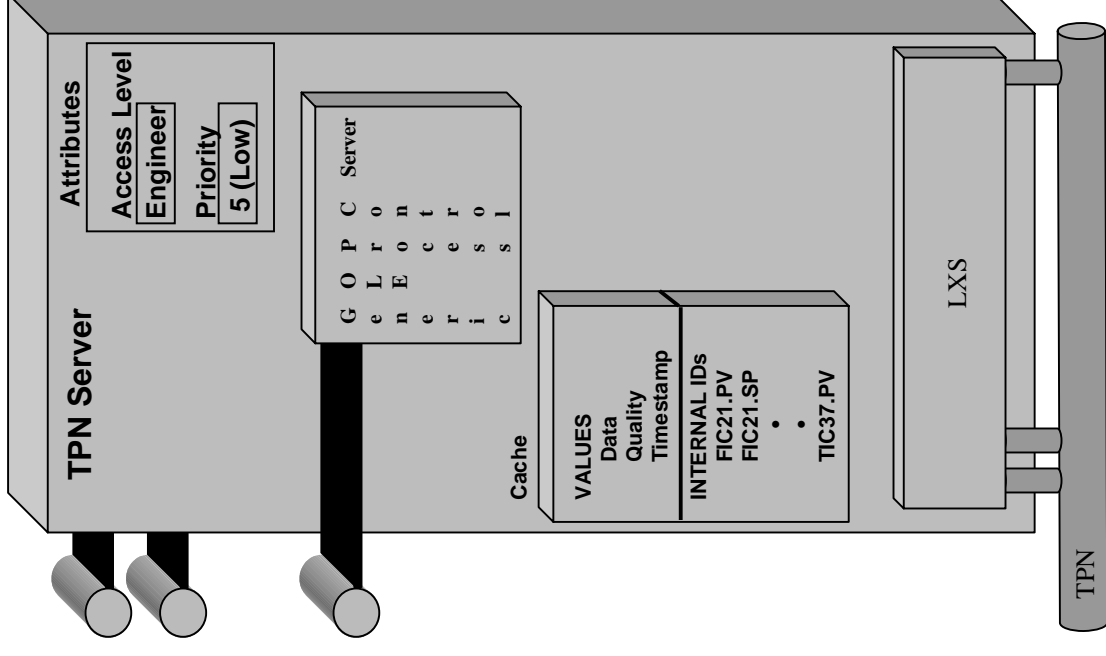
Basic Features

- Supports HCI and standard OPC clients
- Cache
 - TPN Internal Ids
 - Values
- Status Display
 - User Manager Components
 - Start
 - Stop

HCI Specific Interfaces

- Attributes
 - Access Level
 - Priority
- System Management
 - Start/Stop server
 - Server status

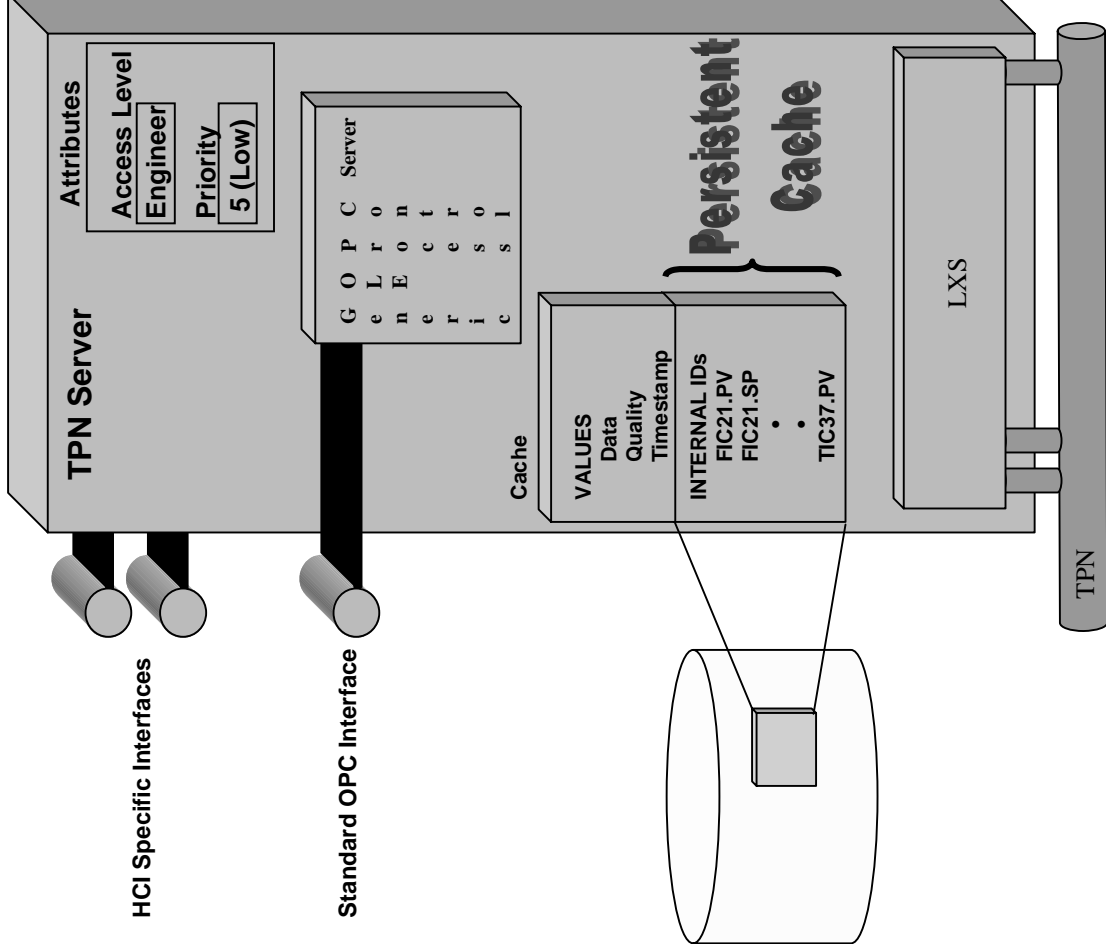
Standard OPC Interface



Install and Configure TPN Server

Overview of Persistent Cache

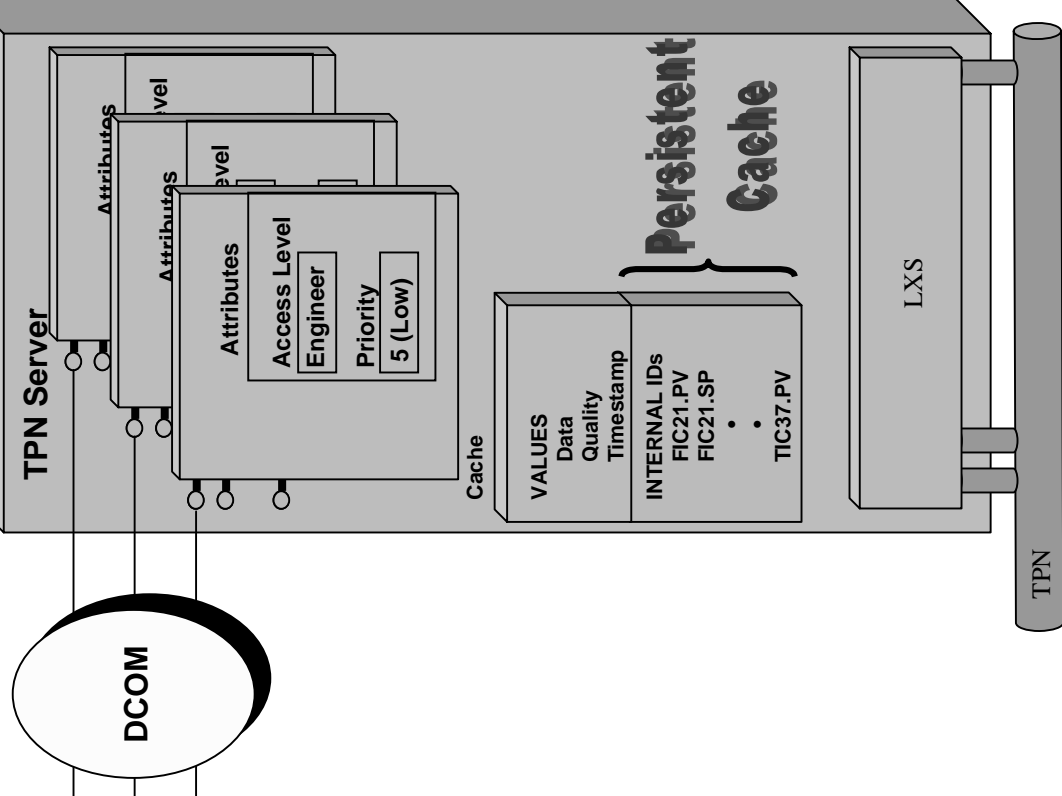
- Contains internal IDs (pointers to point.parameters).
- Can be manually checkpointed from the TPS Status display.
- Copied from the file when the server starts
- TPN Internal IDs are maintained in persistent cache and, therefore, there is no need for clients to manage Internal IDs themselves.
- Values are cached for the duration of the TPN Server execution. They are updated based on the collection rate requested by the client.
- Automatically checkpointed when the TPN Server is shutdown.



Install and Configure TPN Server

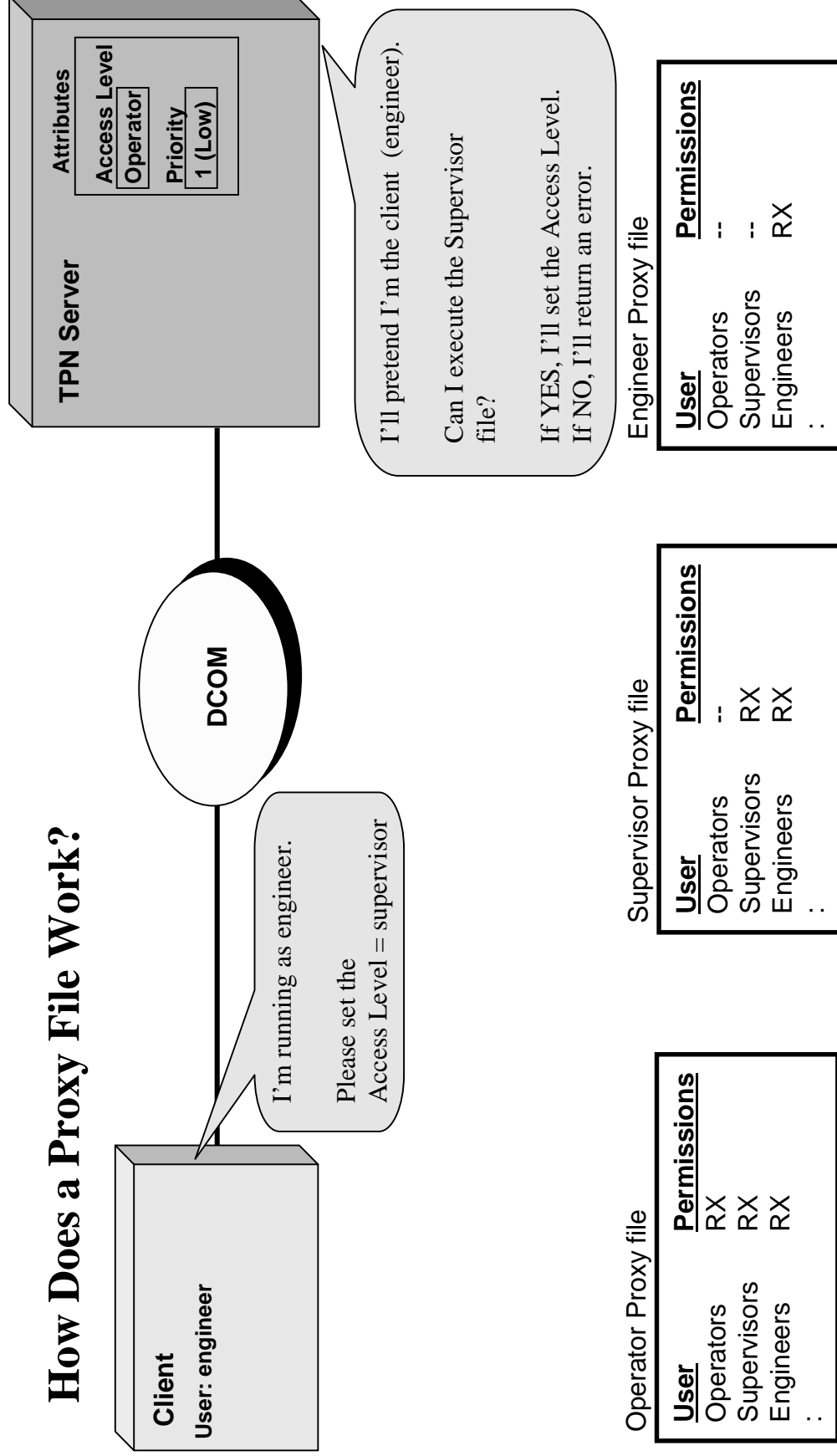
Multiple Client Access

- Each client creates and accesses its own instance of the TPN Server.
- Persistent Cache and Channels are shared by all clients.
- Each client has its own Attributes.



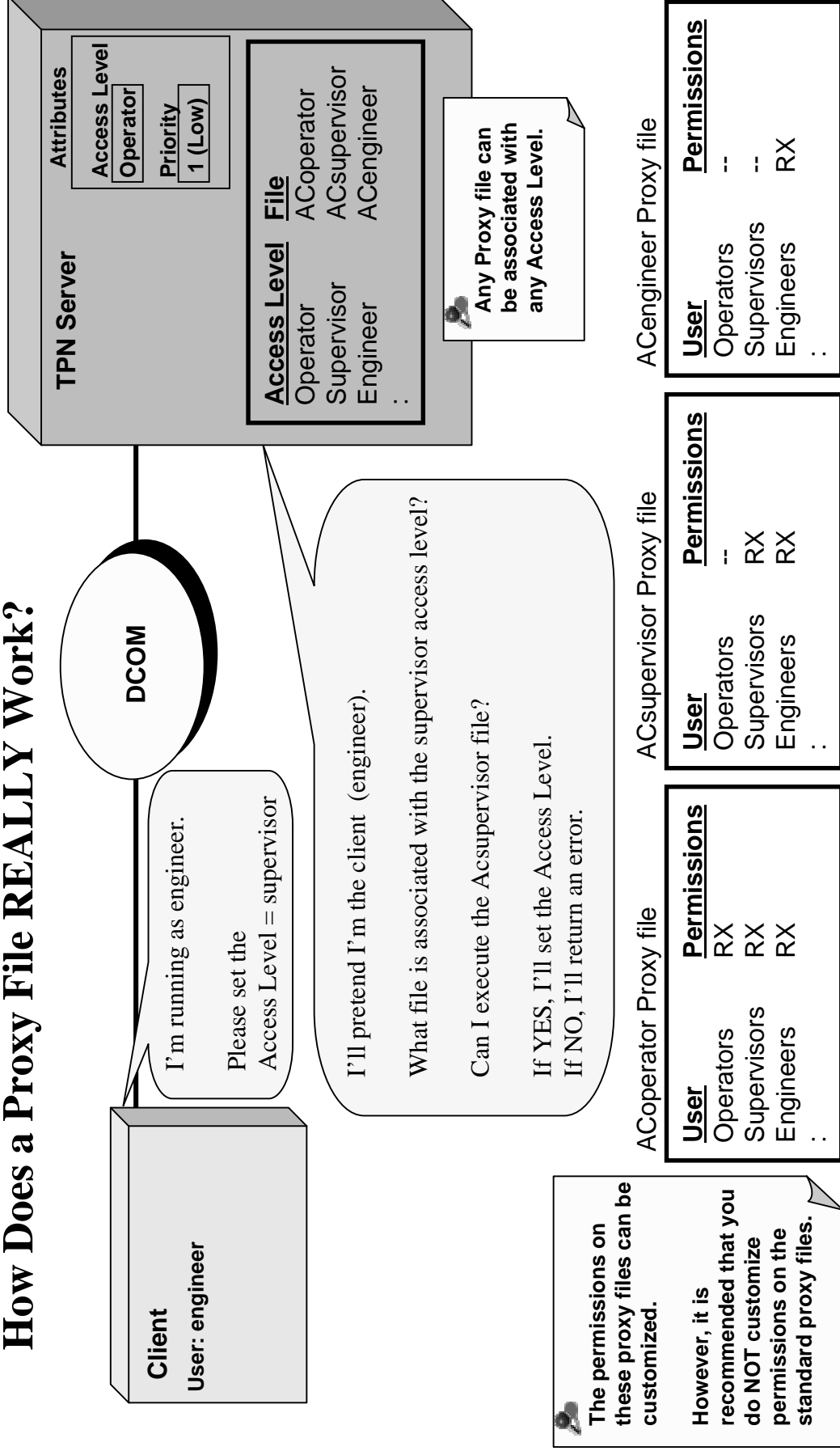
Install and Configure TPN Server

How Does a Proxy File Work?



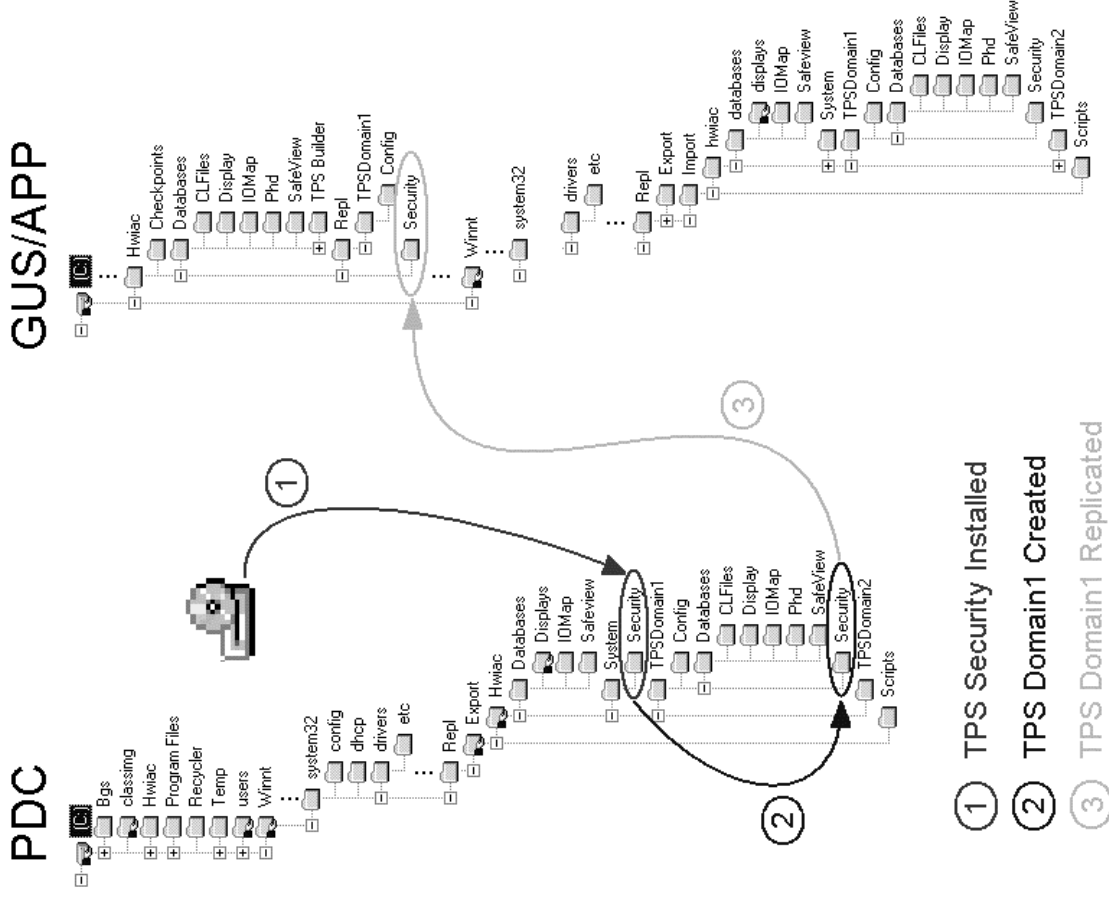
Install and Configure TPN Server

How Does a Proxy File REALLY Work?

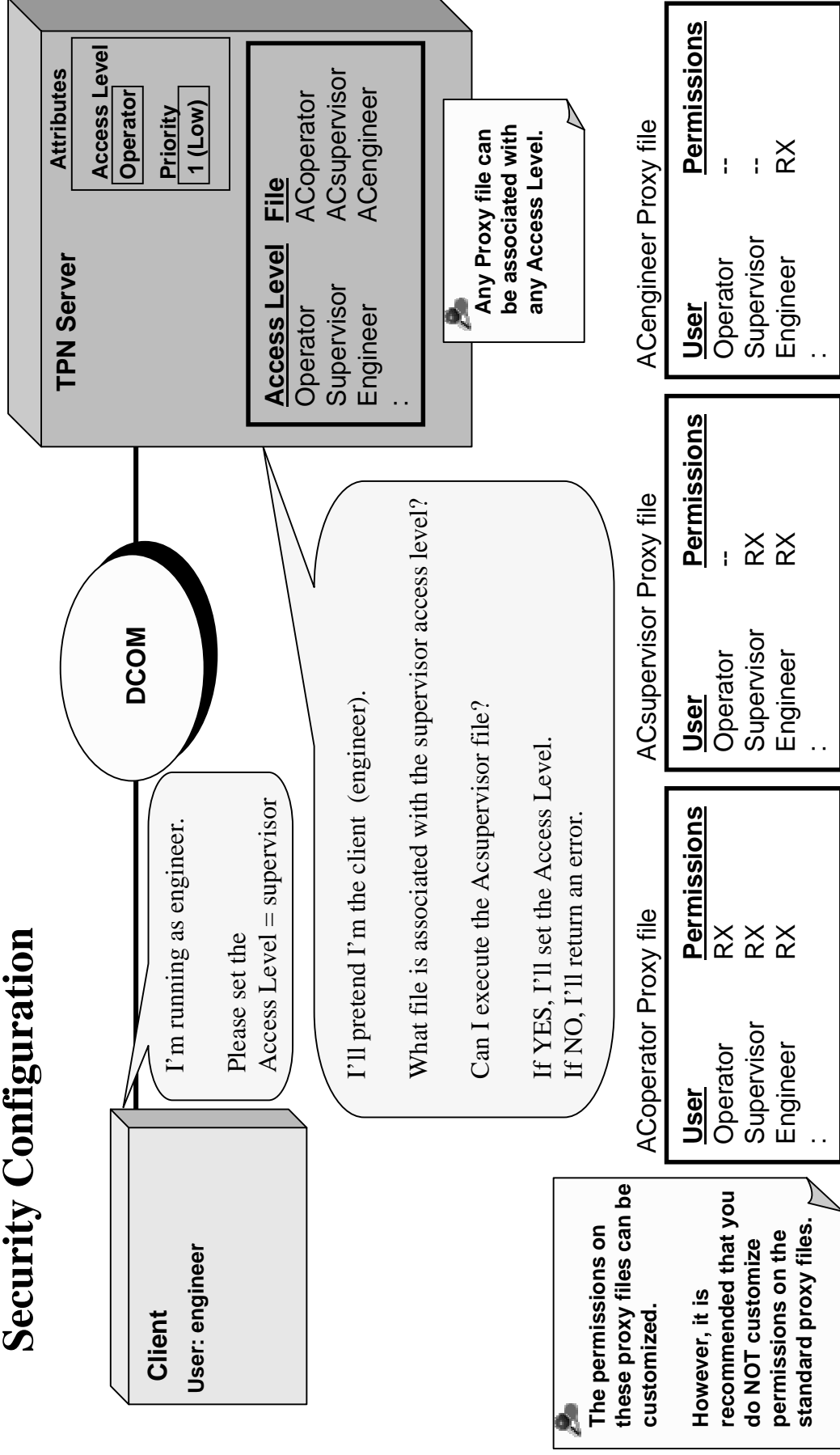


Install and Configure TPN Server Proxy File Location

- Proxy files are created in the **C:\winnt\system32\repl\export\HWIAC\System\security** directory at the time the TPS setup utility is run. These are the master files for all TPS domains.
- Proxy files are duplicated from the above directory (System\security) to the **C:\winnt\system32\repl\export\HWIAC\TPSDomain1\security** directory at the time the first TPS domain is created. These are the master files for this domain.
- Proxy files are duplicated from the above directory (TPSDomain1\security) to the **C:\HWIAC\Security** at the time the **Commit/Replicate** button is selected. These are the files used by the system.



Install and Configure TPN Server Security Configuration



Install and Configure TPN Server

Security Configuration

- Allows you to change the security policy for the TPN Server
- A **policy** consists of the set of proxy files associated with the TPN Access levels and the TPN Server Priority Levels
- If left unchanged, the default policy is used

TPN Security Names

- The names of security policies which have been defined for this server
- TPN Default is the name of the default policy
- A new policy can be defined by clicking on the **Add TPN Security Name** button and then specifying the proxy file associations for the new policy
- The administrator must set the permissions for each proxy file, if they are to be different from the defaults

Capability Names

- Proxy files to be associated with each Access level and Priority Level

The screenshot shows the 'TPNServerAPPI' window with the 'Security' tab selected. The window contains several sections for configuring security settings.

Description: Configuration of the TPN Server Security allows the user to add TPN Security Name and to change the names of the capability names for the TPN Access Level and TPN Server Priority Level.
Note: Changes only take effect after a new connection to a client is made.

TPN Security Names: A text box labeled 'TPN Default' and a button 'Add TPN Security Name'.

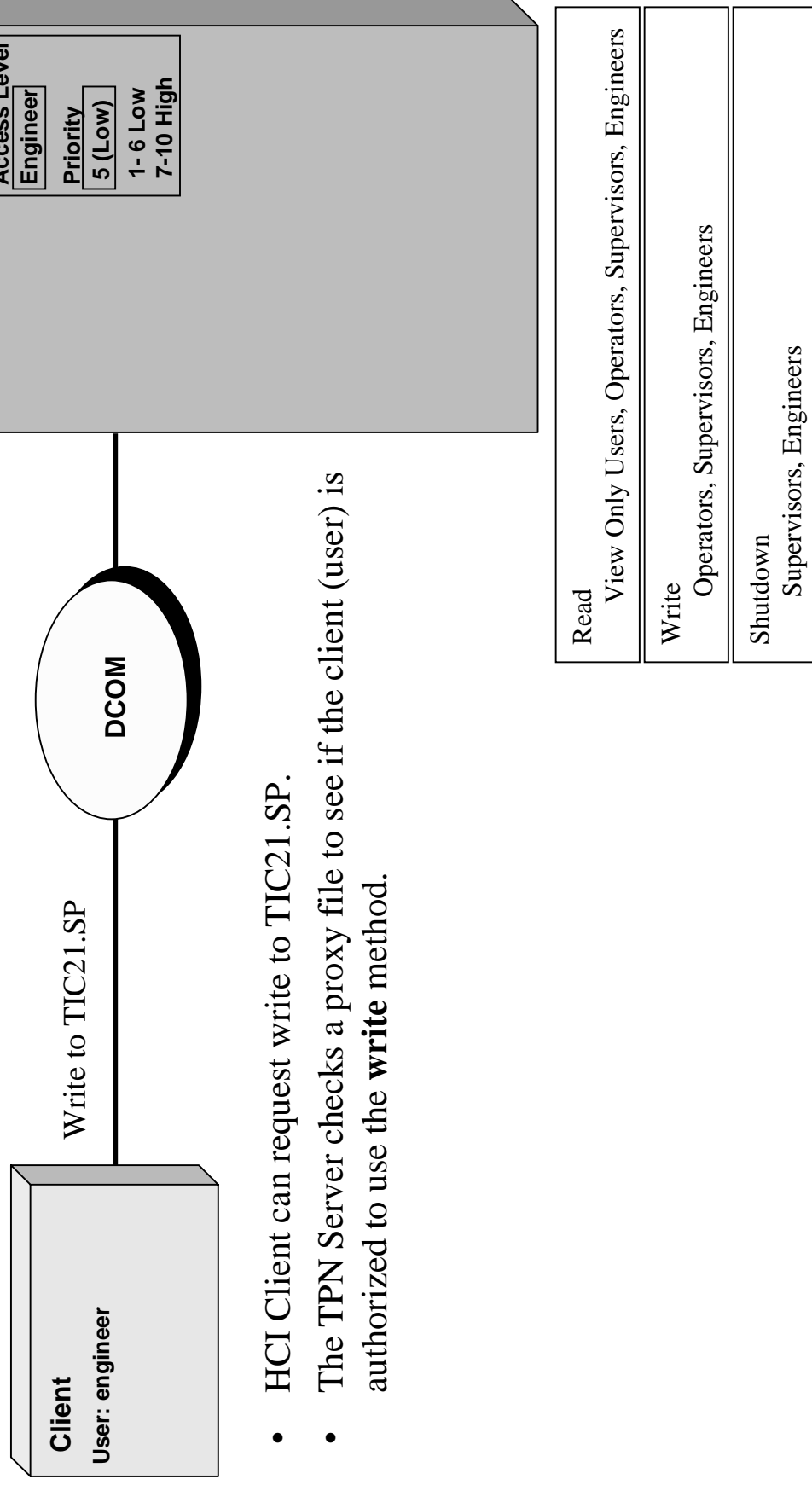
TPN Access Levels: A list of access levels with a 'View Only' button. The list includes: OPERATOR, SUPERVISOR, ENGINEER, PROGRAM, CONTINUOUS CONTROL, POINT BUILDER, and INTIMATE USER. Each level has a corresponding 'Capability Name' text box.

TPN Server Priority Levels: A list of priority levels with 'Capability Name' text boxes. The list includes: 1: (empty), 2: tpn_priority_two, 3: tpn_priority_three, 4: tpn_priority_four, 5: tpn_priority_five, 6: tpn_priority_six, 7: tpn_priority_seven, 8: tpn_priority_eight, 9: tpn_priority_nine, and 10: tpn_priority_ten.

Buttons at the bottom: OK, Cancel, Apply, and Help.

Install and Configure TPN Server

Security Configuration

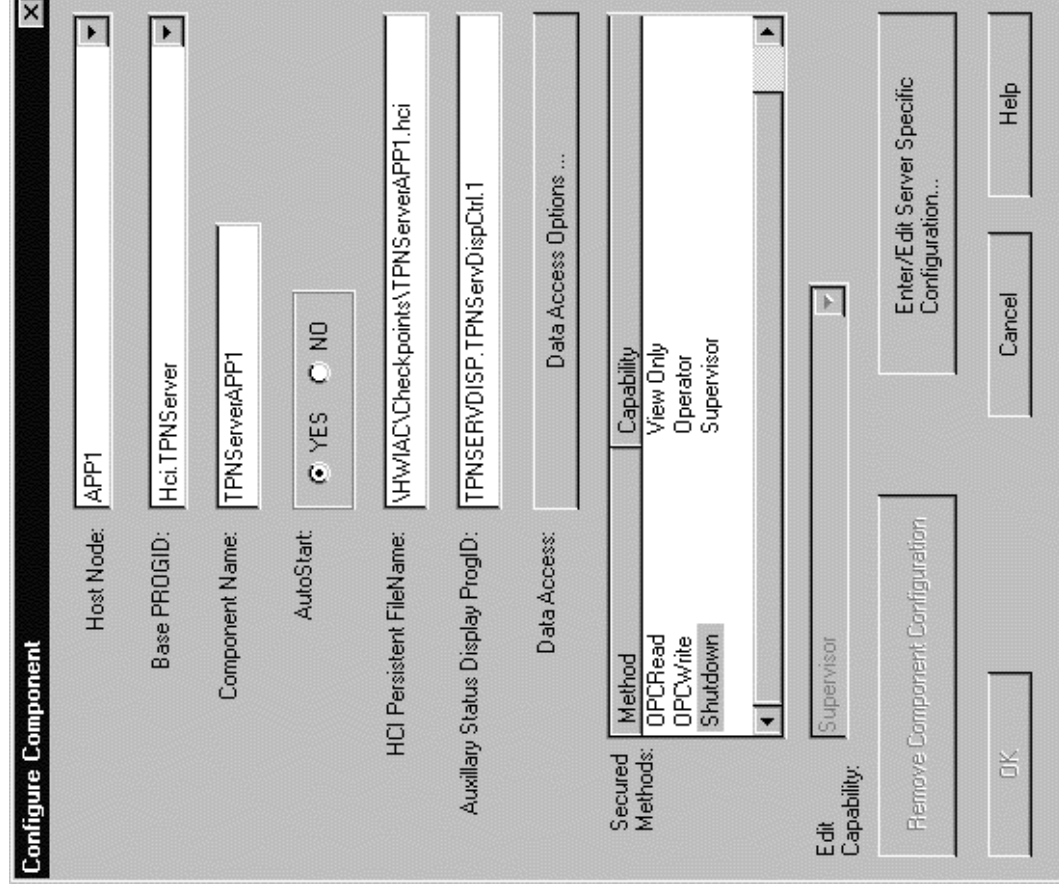


- HCI Client can request write to TIC21.SP.
- The TPN Server checks a proxy file to see if the client (user) is authorized to use the **write** method.

Install and Configure TPN Server

Security Configuration

 **Capability Name =**
Proxy File Name



The "Configure Component" dialog box is used for configuring the TPN Server. It contains the following fields and controls:

- Host Node:** A dropdown menu with "APP1" selected.
- Base PROGID:** A dropdown menu with "Hci.TPNServer" selected.
- Component Name:** A text field containing "TPNServerAPP1".
- AutoStart:** Radio buttons for "YES" (selected) and "NO".
- HCI Persistent FileName:** A text field containing "\Hw\AC\Checkpoints\TPNServerAPP1.hci".
- Auxiliary Status Display ProgID:** A text field containing "TPNSERVDISP.TPNServDispCtrl.1".
- Data Access:** A button labeled "Data Access Options ...".
- Secured Methods:** A list box containing "OPCRead", "OPCWrite", and "Shutdown".
- Capability:** A list box containing "View Only", "Operator", and "Supervisor".
- Edit Capability:** A dropdown menu with "Supervisor" selected.
- Buttons:** "OK", "Cancel", "Help", "Remove Component Configuration", "Enter/Edit Server Specific Configuration...", and "Data Access Options ...".

Install and Configure TPN Server

Will the following be successful?:

1. Logged on as operator, request access level change to supervisor.
2. Logged on as TPSAdministrator, request access level change to operator.
3. Logged on as engineer, request access level change to engineer.
4. Logged on as engineer, request access level change to supervisor.
5. Logged on as supervisor, request access level change to supervisor.
6. Logged on as TPSAdministrator, request access level change to engineer.
7. Logged on as operator, request access level change to operator.
8. Logged on as engineer, request access level change to operator.
9. Logged on as TPSAdministrator, request access level change to supervisor.
10. Logged on as supervisor, request access level change to operator.
11. Logged on as operator, request access level change to engineer.
12. Logged on as supervisor, request access level change to engineer.

TPN Server Configuration:

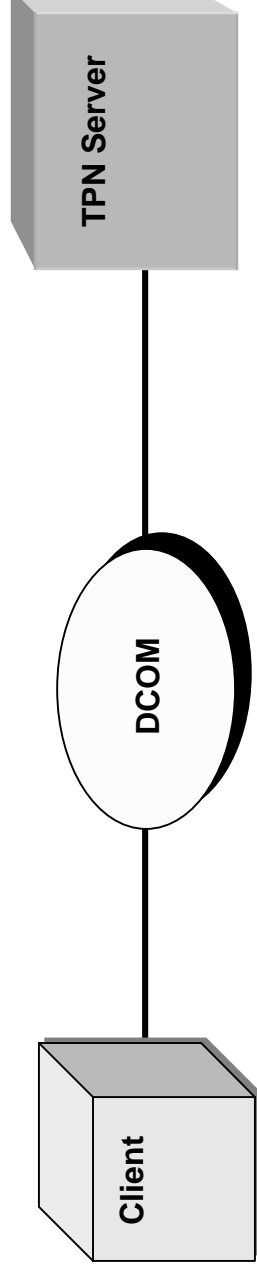
View Only	Bo
Operator	Mary
Supervisor	Julie
Engineer	Bill

Proxy Files:

<u>Julie</u>			<u>Bo</u>		<u>Bill</u>		<u>Mary</u>
View Only	(RX)	Operator	(RX)	View Only	(RX)	View Only	(RX)
Operator	(RWDP)	Supervisor	No Access	Operator	Full	Operator	(RX)
Engineer	No Access	Engineer	(RX)	Supervisor	(RX)	Supervisor	(RW)
TPSAdmin	(RX)	TPSAdmin	(RWDP)	TPSAdmin	(RX)	Engineer	(RX)

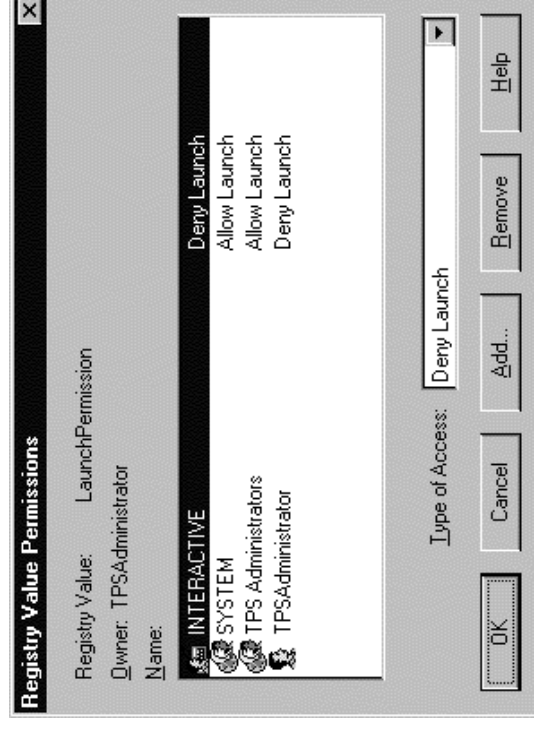
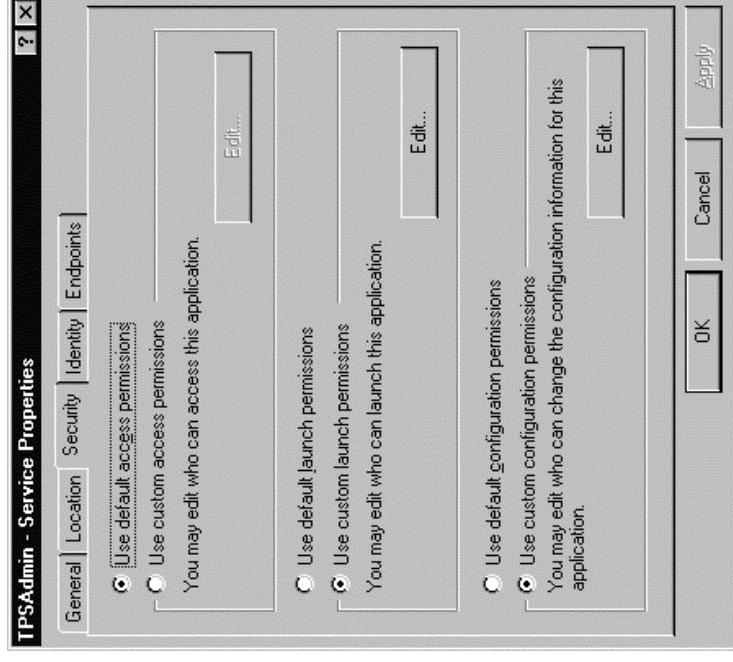
Install and Configure TPN Server

DCOM review



- DCOM is an infrastructure that allows clients to launch and connect to servers
- DCOM configuration allows administrators to determine which clients are authorized

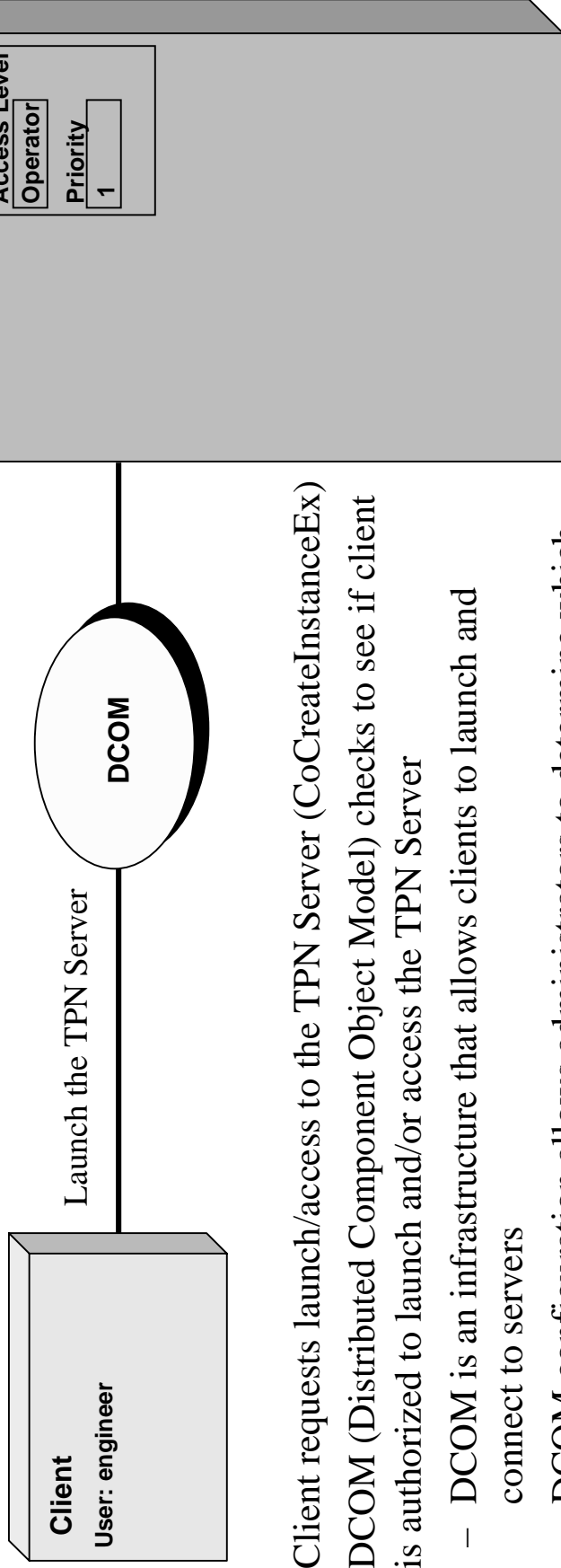
Install and Configure TPN Server dcomcnfg



- Access to the TPN Server is controlled using DCOM Configuration
Start > Run > dcomcnfg
Administrators set permissions on DCOM applications to control who can launch the TPN Server and who can access it.
- Other configuration not discussed here

Install and Configure TPN Server

Default Access and Priority Levels Configuration



- Client requests launch/access to the TPN Server (CoCreateInstanceEx)
- DCOM (Distributed Component Object Model) checks to see if client is authorized to launch and/or access the TPN Server
 - DCOM is an infrastructure that allows clients to launch and connect to servers
 - DCOM configuration allows administrators to determine which clients are authorized
- TPN Server launched with default attributes

Install and Configure TPN Server

Default Access and Priority Levels Configuration

Specifies the default access level and priority level for this TPN Server

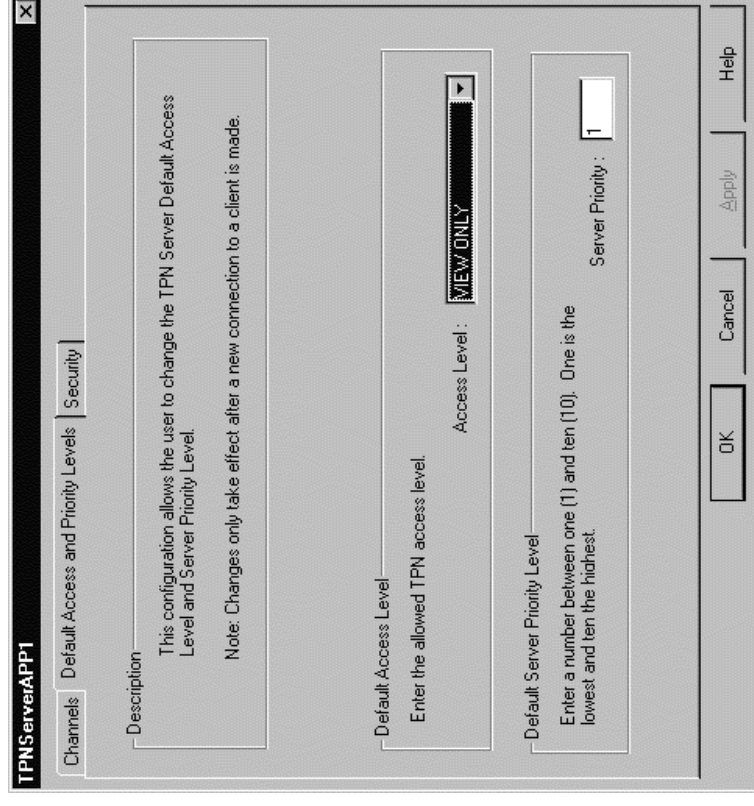
- These are the levels a client uses, if the client does not explicitly change them using SetAttributes
- Access levels should be chosen carefully because any client with access to the server is granted this access level and priority

Default Access Level

- Available levels: ViewOnly, Operator, Supervisor, Engineer, Program, ContinuousControl, or PointBuilder
- IntimateUser cannot be specified as a default
- Default is View Only

Default Server Priority Level

- May specify any value from 1 - 10
- Default is 1



Install and Configure TPN Server

TPN Channel Priority

TPN Server Priority	TPN Channel Priority	TPN System Function Level
1	Low request priority (Low)	Normal display update
2	Low request priority (Low)	Normal display update
3	Non-critical request priority (Low)	New display
4	Non-critical request priority (Low)	New display
5	Medium request priority (Low)	History collection
6	Medium request priority (Low)	History collection
7	Critical request priority (High)	Hi-level control fetch store
8	Critical request priority (High)	Hi-level control fetch store
9	High request priority (High)	Control fetch store
10	High request priority (High)	Control fetch store

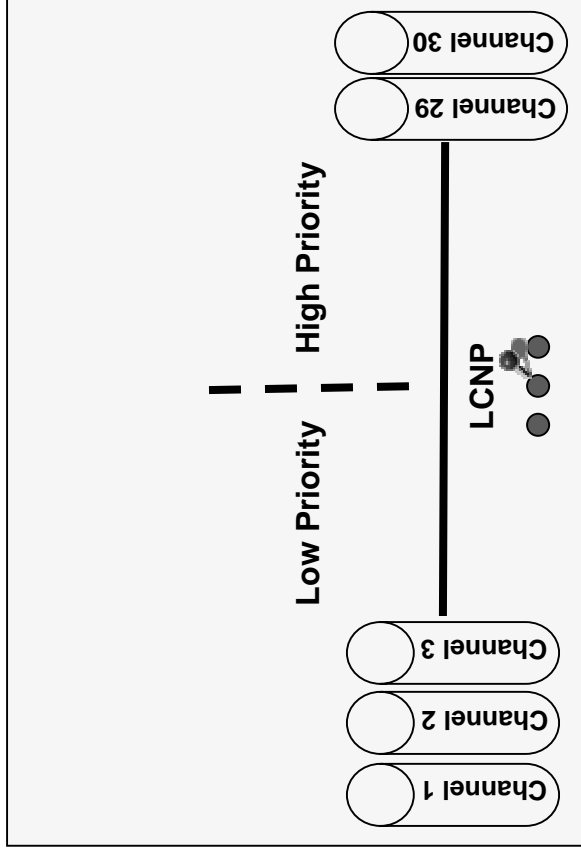
Install and Configure TPN Server

APP Node Channels

- 30 channels available on the APP node
- User chooses the number of channels (out of 30) that will be high priority
- Some low priority channels used by TPSDDE, File Transfer, Time Sync

 **These channels are APP Node channels and may or may NOT be related to the TPN Server**

APP Node



Install and Configure TPN Server

Config Utility → *LCNP_Board_Name* → Data Access Configuration

APP05

LCNP Common Data Access Configuration

Description

Configuration of the DA High Priority Channels and Servers allows the user to decide upon the number of Channels and Servers that DA will reserve for High Priority Requests during initialization.

NOTE: changes only take effect after reloading personality.

This form provides configuration information for the modification of the number of DA High Priority Channels and Servers.

High Priority Channels

Enter a number between zero (0) and twenty (20).

Channels: 10

High Priority Servers

Enter a number between zero (0) and six (6).

Servers: 4

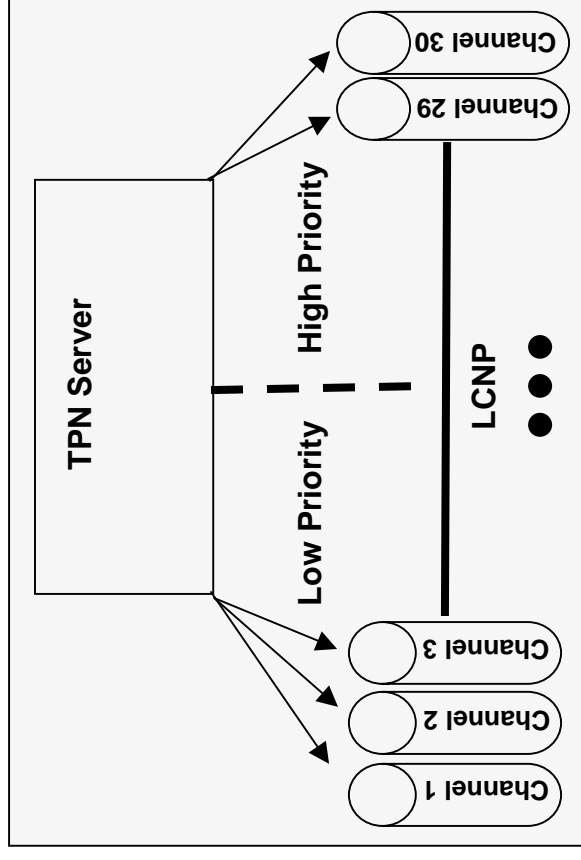
OK Cancel Apply Help

Install and Configure TPN Server

TPN Server Channel Allocation

- The 30 channels are allocated to the NT Servers
- Choose the total number of channels to be used by the TPN Server
- Choose the number of channels used by the TPN Server that will be high priority

APP Node



Install and Configure TPN Server Channels Configuration, continued

TPN Server Channels

- Specify number of channels to be allocated to the TPN Server.
- Default is 10
- Specify the number of allocated TPN channels which are to be reserved for HIGH priority requests.
- Default is 5.
- 0 indicates all channels are LOW priority and are used for both HIGH and LOW priority requests
- Outstanding Requests determines max number of high and low requests that can be queued before client gets EFAIL return
- Recommend leave as default - 100.

The screenshot shows the 'APP5TPNServer' configuration window with the 'Channels' tab selected. The window has a title bar with a close button (X). Below the title bar are three tabs: 'Channels', 'Default Access and Priority Levels', and 'Security'. The 'Channels' tab contains a 'Description' section with text explaining the form's purpose and configuration details. Below this is a 'Notes' section. At the bottom of the window are three input fields for 'Channels To be Allocated', 'High Priority Channels', and 'Outstanding Requests', each with a corresponding 'Channels' or 'Requests' label and a numeric value (10, 5, and 100 respectively). At the very bottom are buttons for 'OK', 'Cancel', 'Apply', and 'Help'.

APP5TPNServer

Channels | Default Access and Priority Levels | Security

Description

This form provides configuration information for the modification of the number of TPN Server Channels.

Configuration of the TPN Server Channels allows the user to decide upon the number of channels the TPN Server will allocate and the number of allocated channels reserved for HIGH Priority requests.

Also, the user may select the maximum number of outstanding ("queued") requests permitted across all channels. When this limit is reached, it is an indication that the server is overloaded. In this case, the server will throttle device requests.

Notes:

Changes only take effect after the TPN Server starts up.

If the TPN Server has been configured to execute on a GUS node, one (1) LOW priority channel will be allocated regardless of the settings displayed on this page.

Channels To be Allocated

Enter a number between one (1) and maximum channels available. Channels:

High Priority Channels

Enter a number between zero (0) and maximum channels allocated. Channels:

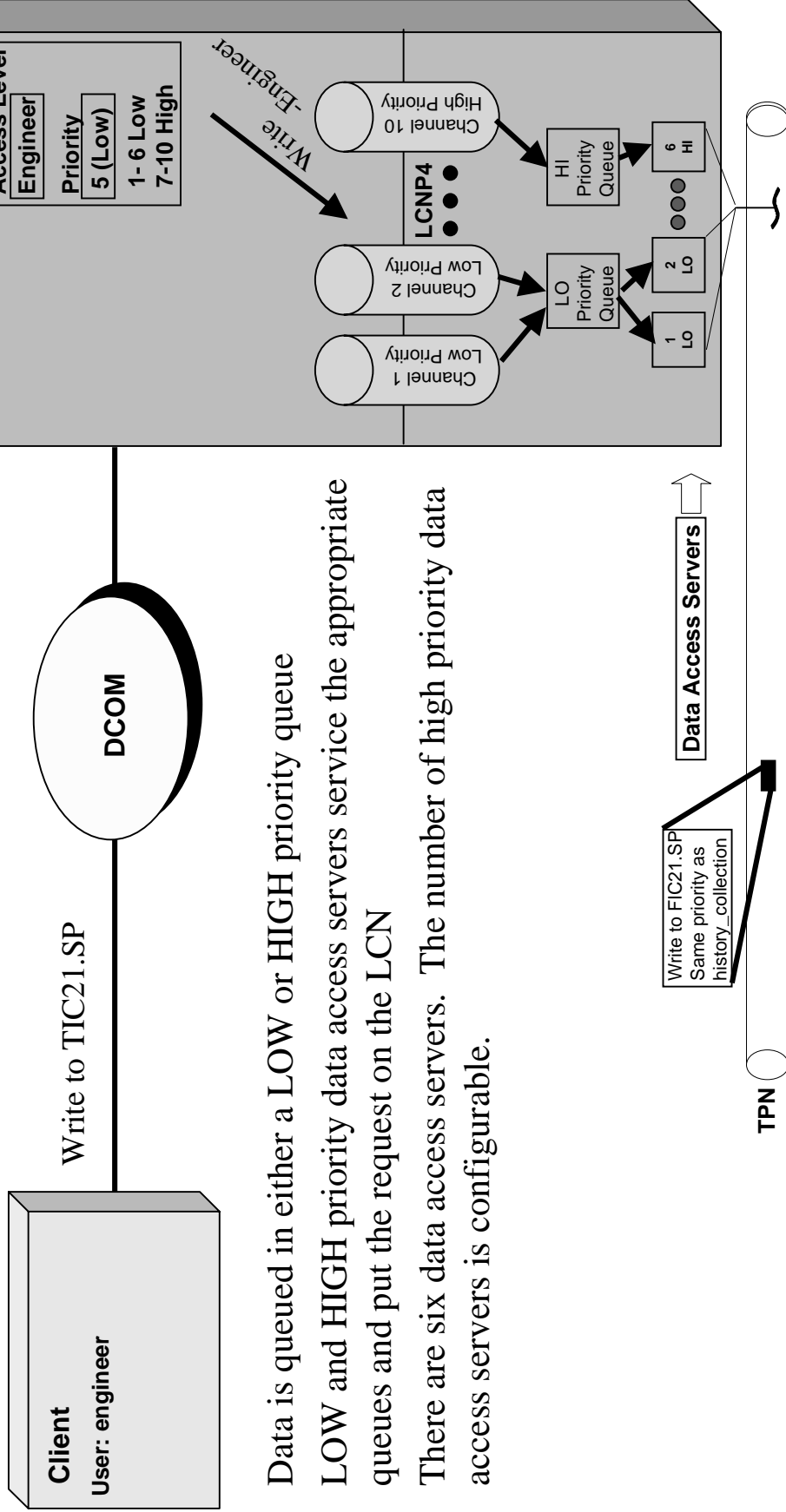
Outstanding Requests

Enter a number between one (1) and maximum outstanding requests permitted. Requests:

OK Cancel Apply Help

Install and Configure TPN Server

Data Access Configuration



- Data is queued in either a LOW or HIGH priority queue
- LOW and HIGH priority data access servers service the appropriate queues and put the request on the LCN
- There are six data access servers. The number of high priority data access servers is configurable.

Install and Configure TPN Server

Config Utility → *LCNP_Board_Name* → Data Access Configuration

APP05

LCNP | **Common** | **Data Access Configuration**

Description

Configuration of the DA High Priority Channels and Servers allows the user to decide upon the number of Channels and Servers that DA will reserve for High Priority Requests during initialization.

NOTE: changes only take effect after reloading personality.

This form provides configuration information for the modification of the number of DA High Priority Channels and Servers.

High Priority Channels
Enter a number between zero (0) and twenty (20). Channels:

High Priority Servers
Enter a number between zero (0) and six (6). Servers:

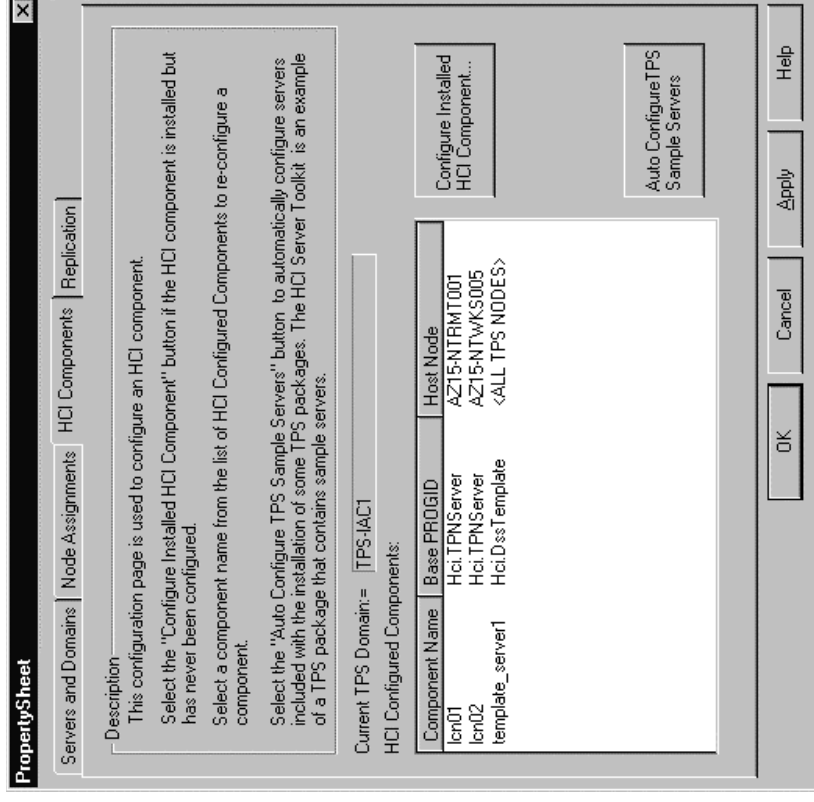
OK **Cancel** **Apply** **Help**

Install and Configure TPN Server

Configuration Overview

- TPN Server must already be installed
- TPN Server must be configured prior to starting it
- TPN Server may be reconfigured while it is shutdown
- Invoke configuration by:
**Start→Programs →
Honeywell TPS →Config Utility**

Configure →TPS Domain



Install and Configure TPN Server

Configuration Steps

- Invoke the TPS Configurator, select **TPS Domain**, then the **HCI Components** tab
 - Click on **Configure Installed HCI Component...** button and then select the Base PROGID **Hci.TPNServer**
 - Specify generic HCI Component information
 - Click the **Enter/Edit Server Specific Configuration** button
- Select the **Channels** page, and configure the TPN channels allocated to the TPN Server
- Select the **Default Access and Priority Levels** page and specify these values
- Select the **Security** page and specify proxy files to be associated with each access and priority level

The screenshot shows the 'Configure Component' dialog box. The 'Host Node' is 'APP1'. The 'Base PROGID' is 'Hci.TPNServer'. The 'Component Name' is 'TPNServerAPP1'. The 'AutoStart' is set to 'YES'. The 'HCI Persistent FileName' is '\\HW\\IAC\\Checkpoints\\TPNServerAPP1.hci'. The 'Auxiliary Status Display ProgID' is 'TPNSERVDISP.TPNServDispCtrl.1'. The 'Data Access' button is visible. The 'Secured Methods' list includes 'OPCRead', 'OPCWrite', and 'Shutdown'. The 'Capability' list includes 'View Only', 'Operator', and 'Supervisor'. The 'Edit Capability' dropdown is set to 'Supervisor'. At the bottom, there are buttons for 'Remove Component Configuration', 'Enter/Edit Server Specific Configuration...', 'OK', 'Cancel', and 'Help'.

Install and Configure TPN Server

Component Configuration

Component Name

- You must specify a component name. You may wish to use a naming convention such as TPN name and server name_number
Example: **Refining_TPNServer1**
- The created <component name> is the Component Name that appears in the TPS System Status display

AutoStart

- Selecting **YES** to AutoStart causes the TPN Server to be started automatically by the TPSAdmin service upon system restart

Install and Configure TPN Server

Component Configuration, continued

HostName

- You must specify a host name, it cannot be left blank
- You must not configure more than one TPN Server per node
- The node must have an LCNP board

HCI Persistent File Name

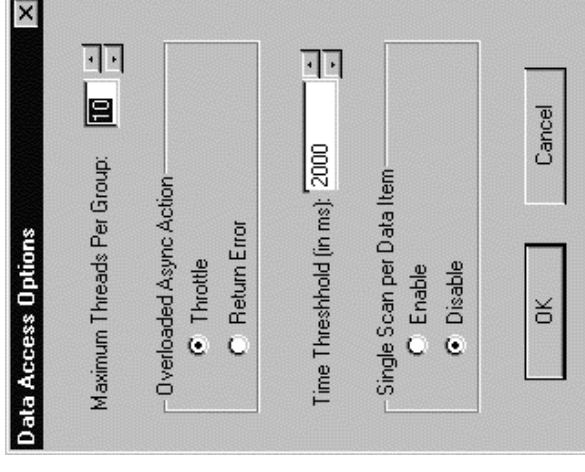
- Do not change this entry
- If there is nothing displayed here, select the **Check Name** button next to the component name

Auxiliary Status Display ProgID

- Do not change this entry

Install and Configure TPN Server Component Configuration, continued Data Access Options

- Generally no changes to these items
- Indicates the maximum threads per group
- **Overloaded Async Action** determines how the server responds to the client when all of the threads are in use.



The image shows a 'Data Access Options' dialog box with the following settings:

- Maximum Threads Per Group: 10
- Overloaded Async Action: ☒ Throttle, ☐ Return Error
- Time Threshold (in ms): 2000
- Single Scan per Data Item: ☐ Enable, ☒ Disable
- Buttons: OK, Cancel

- Throttle causes the client to wait for the queued async action to complete before continuing (Default selection)
- Return Error causes the server to return an error to the client immediately so the client can continue processing
- **Time Threshold** determines how long the server will wait to do a device read after receiving a request to make group/items active. If onDataChange does a read within this amount of time, the server will not do another device read. This will save resources.
- **Single Scan Per Data Item** when enabled ensures that each item is scanned only once regardless of the number of groups in which the item resides.

Install and Configure TPN Server

Component Configuration, continued

Secured Methods

- Configurable methods using OPC Read, OPC Write, and Shutdown
- Allows you to enter the name of a proxy file for each method and determines which clients will be able to perform each of the methods
- Configure using the **Edit Capability** text box

Install and Configure TPN Server

Channels Configuration

Channels to be allocated to TPN Server

- Specify the number of APP Node channels to be allocated to this TPN Server
- A maximum of 30 channels is available for all NT servers which access the TPN
Examples: TPN Server and File Transfer
 - Default is 10
 - Channels are shared by all TPN Clients
 - Specify the number of channels that will be high priority channels
 - Default is 5
 - Outstanding Requests determines maximum number of high and low requests that can be queued before client gets EFAIL return
 - Recommend leave as default - 100.

The screenshot shows the 'APP5TPNServer' configuration window with the 'Security' tab selected. The window has a title bar with a close button (X). Below the title bar are three tabs: 'Channels', 'Default Access and Priority Levels', and 'Security'. The 'Security' tab is active, displaying a 'Description' section with text about configuration information and a 'Notes' section with information about the TPN Server's operation. Below these sections are three configuration groups, each with a title and a text box for input:

- Channels To be Allocated:** Enter a number between one (1) and maximum channels available. The input field contains the value '10'.
- High Priority Channels:** Enter a number between zero (0) and maximum channels allocated. The input field contains the value '5'.
- Outstanding Requests:** Enter a number between one (1) and maximum outstanding requests permitted. The input field contains the value '100'.

At the bottom right of the window are four buttons: 'OK', 'Cancel', 'Apply', and 'Help'.

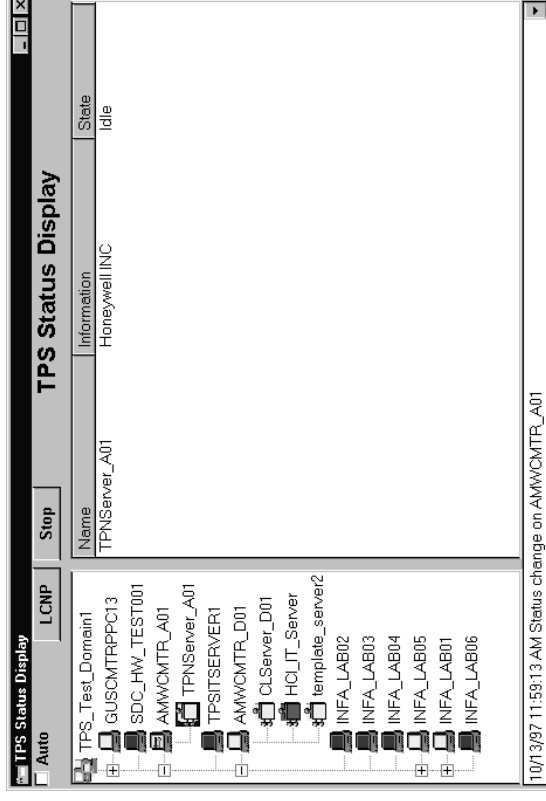
Operate TPN Server

- TPS Status Display
 - HCI Component
 - Auxiliary Status Display
 - Scope Frame States
 - Component Status
 - Status Frame
 - Auxiliary Status Display
-

Install and Configure TPN Server

TPS Status Display

- Shows the states of the TPS nodes configured in the TPS domains
- Shows the states of the HCI-managed components in the TPS nodes
- Node and component failures are shown in this display
- Startups and shutdowns can be performed from this display
- Displays on different nodes are independent - may show different information
- Displays are updated about every 15 seconds.



Install and Configure TPN Server

Auto Check Box

- The Auto Check Box is located at the top of the screen. Left mouse clicking it toggles check/no check to be displayed. The checked box causes the display to beep and select a node on which the status has changed.

LCNP Button

- The LCNP button launches the LCNP Status applet with "-s" option, which allows you to view the LCNP applet for remote nodes.

Events Combo Box

- The Events Combo Box is located at the bottom of the TPS Status display and presents a list of important status display events.

Install and Configure TPN Server

TPS Status Display

Scope Frame

The Scope Frame shows a tree display composed of three levels. Double-click the left mouse on a level to expand/contract the tree display.

- **.Domain** name - top of tree
- **.Node** name - second level
- **.Component** name - third level

The Scope Frame provides an icon that gives you a quick visual indication of the state of the component.

Install and Configure TPN Server

HCI Component

Within TPS, the base communication objects are referred to as HCI Components.

HCI Managed Components

- Support the IHciComponent interface
- Visible to and managed by the TPS System Management Subsystem

HCI Server Components

- Support the OPC interfaces
- In-process (.DLL) or out-of-process (.EXE) files
 - In-process server components do not support the IHciComponent interface and are not managed by the TPS System Management Subsystem
 - Out-of-process server components support both the OPC and HCI interfaces

Install and Configure TPN Server

Scope Frame States

Green	Component is in the Running or Idle State. The TPS Network Personality is running and the server is fully functioning.
Yellow	Component is in the Warning or Stopped State. A) It is waiting for the TPS Network Personality to be loaded and transition to the running state on the LCNP in the local node. B) It has lost its connection to the TPS Network Personality.
Red	Component is <u>not</u> in Running or Warning State. The TPS System Status Display{ XE "System Status Display" } will default to the Stopped state if the TPN Server{ XE "TPN Server" } is not running.

Install and Configure TPN Server

Component Status

State (Status) Column	Icon Color	Server Status Values
Stopped	YEL	Component is not currently operational, but has been configured on the node.
Initializing	YEL	Component is initializing
Test	YEL	Component is in a testing state
Idle	GRN	Component is operational, but no clients are connected
Running	GRN	Component is running
Warning	YEL	Component is running, but it has a problem that is not disabling the component
Shutting down	YEL	Component is shutting down
Failed	RED	Component terminated abnormally

Install and Configure TPN Server

Connecting to the TPS Process Network

- For a connection to occur, a TPN personality (APP or unpw) must be loaded on the LCNP
- If this connection is not established, the TPN Server goes into a **Warning** state where it rejects all requests and client connections
 - TPN Server returns an **E_FAIL HRESULT** to any clients attempting to connect
- When the connection is established, the TPN Server transitions from the **Warning** state to the **Idle** or **Running** state where it allows client connections and requests

Install and Configure TPN Server

During Runtime

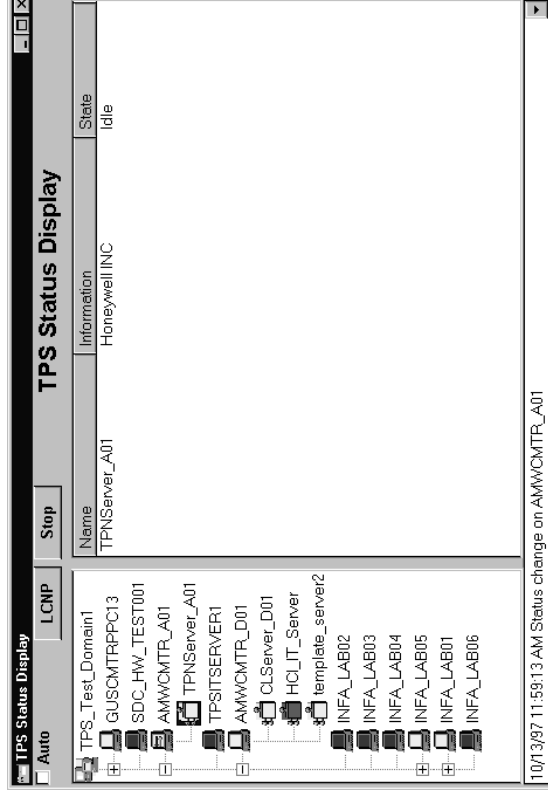
- In runtime, the state of the connection is continuously checked and reported to the TPS System Status display
- If the connection is broken:
 - The TPN Server transitions from the **Idle** or **Running** state to **Warning**
 - All current client connections with the TPN Server are maintained
 - All OPC requests made by a client to the server, fail and return an **E_FAIL HRESULT**
 - All new client connection requests fail and return an **E_FAIL HRESULT**
- When the connection is reestablished:
 - The TPN Server transitions from the **Warning** state to **Idle** or **Running**
 - All OPC requests made by a clients are processed
 - All new client connections are processed

Install and Configure TPN Server

Status Frame

Information for item selected in Scope Frame

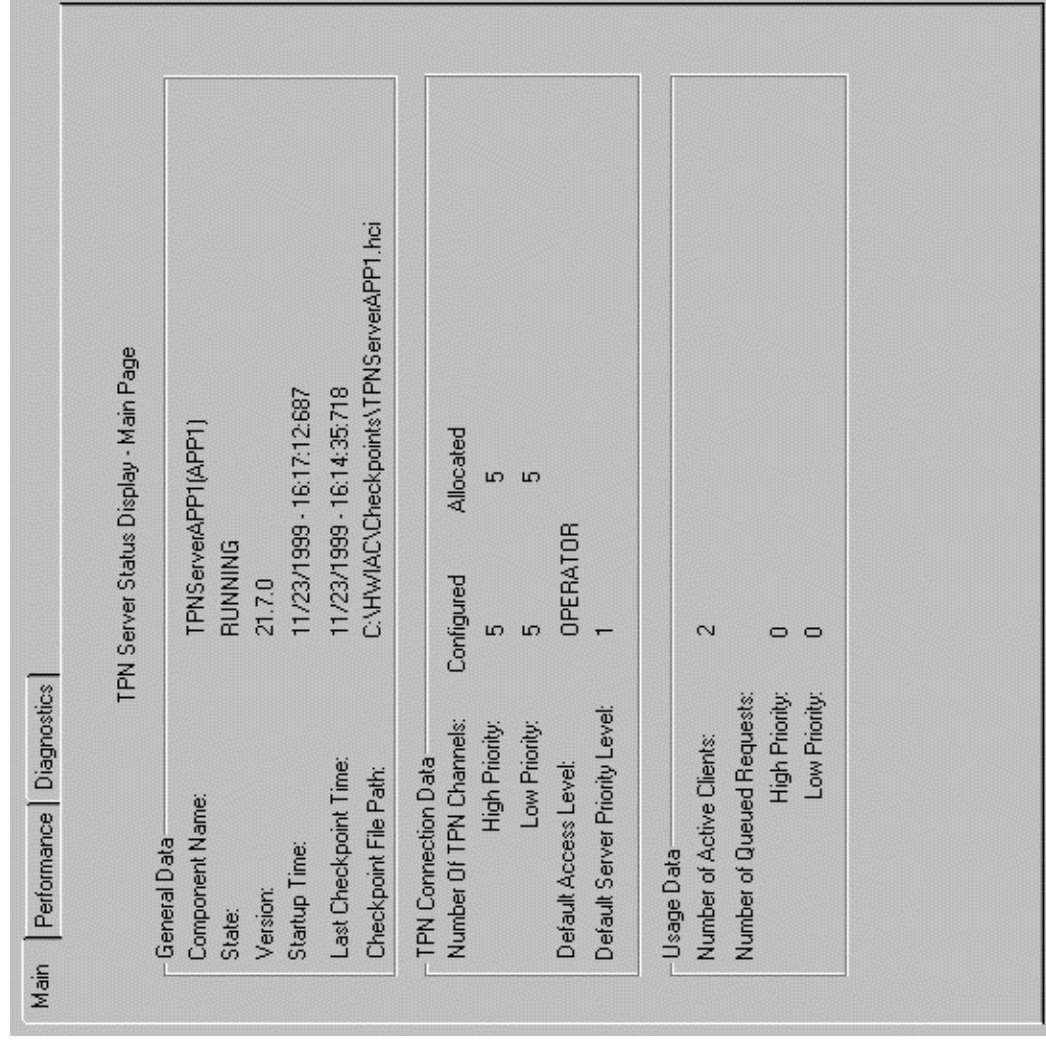
- name
- supplementary information
- state



Install and Configure TPN Server

Auxiliary Status Display

- Main Tab
- Double-click on the component to get this display in place of the status frame (on the right side of the TPS Status).



Install and Configure TPN Server

Auxiliary Status Display - Main Tab

TPN Server General Data section provides the following information:

State –The State of the currently active TPN Server. The Auxiliary Status display is activated only after the component starts and therefore only a subset of the possible HCI states is available for viewing. Due to their transitory nature some of these states will never be shown. The State will be one of the following values:

- **FAILED** – The server has reached an unrecoverable error and has failed.
- **IDLE** – The server is running, but no clients are connected.
- **INITIALIZING** – The server is initializing
- **RUNNING** – The server is running, and clients are currently connected
- **SHUTDOWNCOMPLETE** – The server shutdown has completed.
- **SHUTTINGDOWN** – The server is shutting down
- **TEST** – The component is performing a self test
- **WARNING** – The server is running, but there is no connection to the TPS Network.

Version – The version number of the currently active TPN Server.

Startup Time – The time and date the TPN Server was started.

Last Checkpoint Time – The time and date of the Last Checkpoint. The checkpoint file contains item definitions that are valid only for the TPN system that is connected to the TPN server. If the underlying TPN system is changed, then the checkpoint file may become invalid. In this case, the invalid checkpoint file must be deleted.

Checkpoint File Path – The path of the Checkpoint file.

Install and Configure TPN Server

Auxiliary Status Display - Main Tab, continued

The **TPN Network Connection Data** section provides information on the TPN Channel Connections made by the TPN Server.

Number Of TPN Channels - There are two columns of data provided.

- The first column contains the number of both High and Low Priority TPN channels that were configured in the TPN Server Channel Configuration page.
- The second column contains the number of both High and Low Priority TPN channels that the TPN Server was able to allocate for use at runtime. The number of Configured Channels should be equal to the number of Allocated Channels. If the numbers do not match, the TPN Server was not able to allocate all of the Configured Channels for use. In other words, at the time the TPN Server was started, the number of available TPN channels was less than the number of channel the TPN Server is configured to use.

Default Access Level - This is the default access level that was configured in the TPN Server Access and Priority Level Configuration page. If the client does not explicitly set the access level for a store request then the TPN Server uses this default access level.

Default Priority Level - The default server priority level that was configured in the TPN Server Access and Priority Level Configuration page. If the client does not explicitly set the server priority level for accessing the LCN data then the TPN Server uses this default server priority level.

Install and Configure TPN Server

Auxiliary Status Display - Main Tab, continued

The **TPN Server Usage Data** section provides runtime usage data on the TPN Server.

Number of Active Clients – The number of client connections to the TPN Server.

Number of Queued Requests – The TPN Server queues both High and Low Priority requests while all Allocated Channels are busy.

- The number of High and Low Priority requests that are waiting to be processed by an available channel are displayed. Typically, the number of queued requests should be low.
- Values are updated on one-second intervals.
- A value of zero means that all requests are immediately processed.
- Values greater than zero mean that requests are being queued until a channel becomes available.
- A large number of requests being queued will signal a heavy load on the TPN Server and potential performance problems. In this event, either limit the number of client connections, or increase the number of configured channels.

Install and Configure TPN Server

Auxiliary Status Display

- Performance Tab

MainPerformanceDiagnostics

TPN Server Status Display - Performance Page

General Data

Component Name:
TPNServerAPP10(ΔPP10)
State:
RUNNING

Performance Data

Performance Data Update Interval (Seconds):
10
Device Data Access: (NOTE: Per second values are averaged over Data Update Interval.)
Parameter Reads Per Second: 0
Parameter Writes Per Second: 0
Total Parameter Reads/Writes Per Second: 0

Server Metrics Since Startup

NOTE: Counters will reset to zero on 32 bit value overflow.
Device Data Access:
Parameter Reads: 1046
Parameter Writes: 0
Total Parameter Reads/Writes: 1046
Read/Write Parameters Returning
Failed Error Codes: 0
Device Get Item Definition:
Successful Requests: 0
Failed Requests: 0
Active List Size: Disabled

Install and Configure TPN Server

Auxiliary Status Display - Performance Tab

Performance Data

- **Performance Data Update Interval (Seconds)** – The interval at which data in this section is updated. By default, it is 10 seconds.
- **Device Data Access** – The average number of data accesses per second (reads, writes, and total) from the TPN Network. This is an average value over the Data Update interval

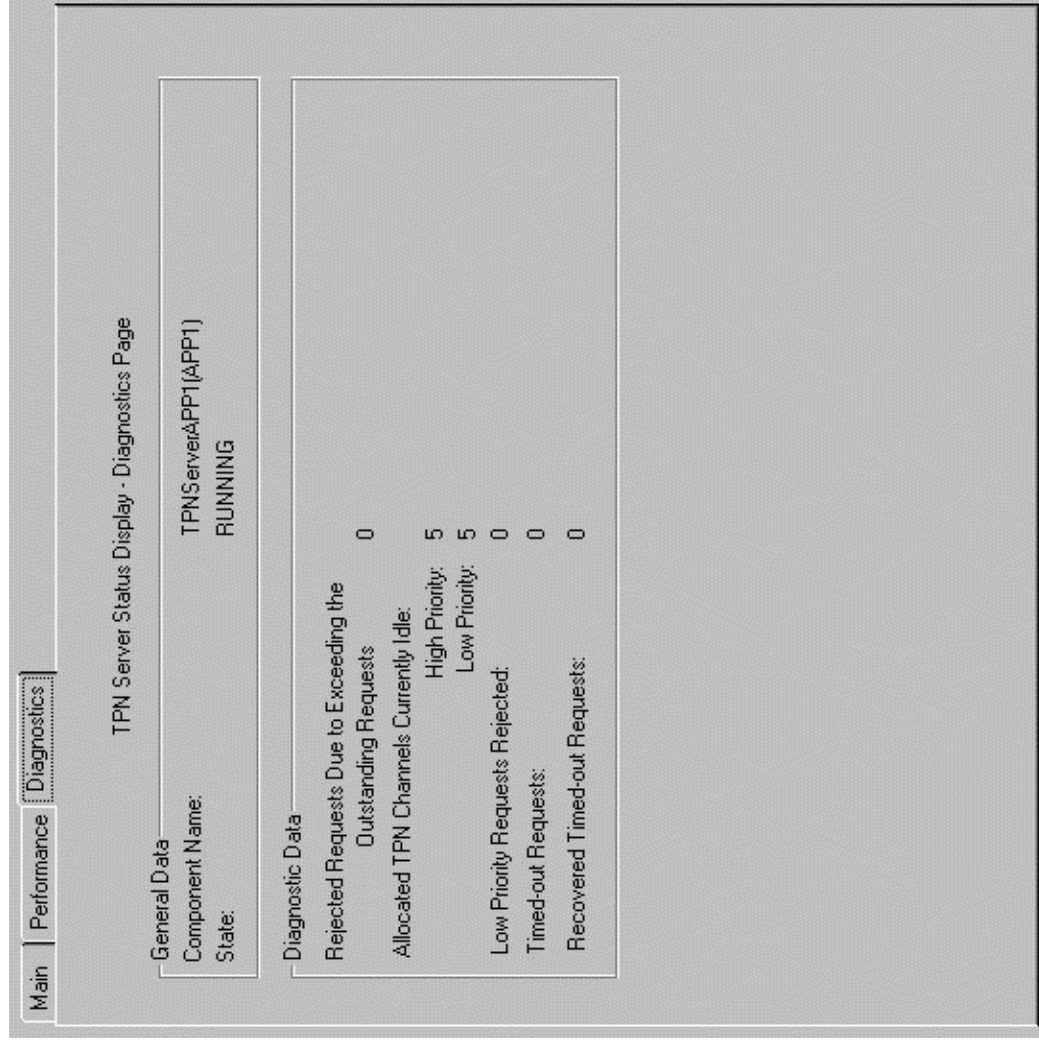
Server Metrics Since Startup

- **Device Data Access** – The total number of data accesses per second (reads, writes, total, and total with errors) from the TPN Network since the TPN Server was started.
- **Device Get Item Definition** – The total number of Get Item Definition requests since the TPN Server was started. Get Item Definition requests generally occur when a point.parameter requested was not found in the checkpoint for the server.
- **Active List Size** – The number of active items currently in the TPN Server's Active List. This value will be enabled only if the Single Scan Per Data Item is enabled in the Data Access Options section of the TPNServer Component Configuration page.

Install and Configure TPN Server

Auxiliary Status Display

- Diagnostics Tab



Install and Configure TPN Server

Auxiliary Status Display - Diagnostics Tab

Diagnostic Data

- **Rejected Requests Due to Exceeding the Outstanding Requests Permitted** – The total number of requests rejected since the TPN Server was started. These requests were rejected because the number of outstanding requests (displayed on the Main tab) has exceeded the number of Outstanding Requests Permitted as configured on the Channels tab of the TPN Server Specific configuration.
- **Allocated TPN Channels Currently Idle** – The number of channels currently waiting for a request to process. If either of these numbers is consistently zero, you should consider increasing the number of channels allocated.
- **Low Priority Requests Rejected** – The number of low priority requests rejected because there were no low priority TPN channels available. Note: This restriction does not apply to high priority requests. If there are no high priority TPN channels available, a high priority request can be sent on a low priority channel.
- **Timed-out Requests** – The number of TPN Server requests that have not been serviced within eight minutes. When a request is not serviced, there is a high probability that one, or more TPN channels are hung. This situation may lead to poor TPN Server performance. This metric should be used in conjunction with the Recovered Timed-out Requests metric. In the event, where timed out requests have occurred, and the TPN Server subsequently recovered from the timeout (timed-out requests = recovered timed-out requests), the TPN channels will no longer be hung.
- **Recovered Timed-out Requests** – The number of TPN Server requests, that had timed-out, but were eventually processed.

Install and Configure TPN Server

Auxiliary Status Display, continued

ATTENTION

- If the value is displayed as “?” then the data are either inaccessible or the TPN Server is no longer running.
- If the TPN Server has failed, the State value displays **FAILED**, and the rest of the values display “?”.
- If the TPN Server is in the **WARNING** State, the values pertaining to the “Number of TPN Channels” and the “Number of Queued Requests” display “?”.