

ZyXEL Prestige 2.20 Release Note/Manual Supplement

Date: March 6, 1999

This Release Note/Manual Supplement contains information about the new features, and bug fixes since the release v1.50(x.00).

The **New Features** section lists the new features added to this release. Please read through the **Enhancement Details** section for detail information. A new section, **Changes not Compatible to Previous Versions**, is added to this release notes. It is important to read it too.

New Features:

More Remote Nodes and IP Static Routes

Version 2.20 offers 8 IP Static Routes in all models. v2.20 offers 8 Remote Nodes in Prestige 100 and Prestige 100IH, and 12 Remote Nodes in the Prestige 128+.

Easy Installation

Most new Prestige owners now need only enter the ISDN phone numbers (supplied by the ISDN provider) in Menu 2, and the phone number, user ID, and password (supplied by the ISP) in Menu 4.

Nailed-up Connection

This new feature allows a dial-up line to emulate a leased line.

Backup and Restore Configuration File via LAN or WAN

PCT (Prestige Configuration Transfer), the stand-alone Java-based utility, allows backup and restoration of the configuration file via LAN or WAN.

Upgrade P100IH Firmware via LAN

PCT can upgrade the Prestige 100IH firmware over the local LAN.

L2TP Support to P128+ Model

L2TP support in Prestige 128+ allows user to route/bridge protocols over the Internet.

DSS-1 ISDN Supplemental Services

DSS-1 ISDN Supplementary Services are supported in this release. These services work properly only if the needed functions subscribed from the PTT.

Changes not Compatible to Previous Versions:

New OS

This release is based on ZyNOS. ZyNOS is ZyXEL's new generation operating system. The internal data structure of the configuration between ZyNOS and pre-ZyNOS is different. The v2.20 firmware will automatically convert the pre-ZyNOS configuration into ZyNOS's. But since pre-ZyNOS firmware are unable to read the format of the ZyNOS configuration, save a copy of the pre-ZyNOS configuration file (via Menu 24.5) prior to upgrading your Prestige, in case you wish to downgrade back.

To revert to pre-ZyNOS versions:

1. Load the firmware into the Prestige, via Menu 24.7 or with the ATUR command in Debug mode.
2. Load the pre-ZyNOS ROMFILE0 from the Zyxel web site into the Prestige with the ATUR3 command in Debug mode.
3. Start the Prestige.
4. Restore the saved configuration file via Menu 24.6.

CI Commands

ZyNOS keeps the familiar user interface (SMT, System Management Terminal) although the internal architecture is vastly different. The syntax and semantics of the CI commands remain the same even though some of them are changed.

Here is the brief description about the most frequently used CI commands. The sequence of the following table is based on the v2.20 commands' alphabetic order.

pre-ZyNOS	v2.20	brief description
bridge stat disp	*	statistics on Bridge packets
bridge blt disp	*	Bridge LAN table
bridge brt disp	*	Bridge WAN table
	dev channel disp [bri0 bri1]	show channel information on bri0 or bri1
isdn drop [1 2]	dev channel drop [bri0 bri1]	drop channel bri0 or bri1
isdn dial x	dev dial x	manually dial to remote node x; x is the remote node number here
	ether config	show the current Ethernet configuration
lan cnt disp	ether driver cnt disp	statistics on the Ethernet driver
exit	*	exit from CI mode
ip address	*	LAN IP address
ip ping {IP address}	*	Ping {IP address}
ip route stat	*	IP routing table
ip status	*	statistics on IP packets
ip sua iface [wan0ppp wan1ppp] disp	ip sua iface [wanif0 wanif1] disp	display the SUA table for iface wanif0 or wanif1
ipx route stat	*	IPX routing table
ipx sap stat	*	IPX SAP table
	isdn atring clear [bri0 bri1]	clear the ISDN ring buffer of bri0 or bri1
isdn drv ring [1 2]	isdn atring disp [bri0 bri1]	display the ISDN ring buffer of bri0 or bri1
isdn clidcb [on off]	isdn callback speedyclid [on off]	enable/disable speedy CLID callback
dialer timeout callback x	isdn callback timeout x	set callback timeout to x seconds
	isdn config	show the current ISDN configuration
sys epa	isdn fw ana dump	display ISDN trace messages on screen
isdn ana [on off]	isdn fw ana [on off]	enable/disable ISDN trace mechanism
Isdn p128 cnt disp	Isdn fw cnt disp	display ISDN transmission counters

	isdn initstring clear	clear ISDN init string
isdn set initstring {at commands}	isdn initstring set {at commands}	set ISDN init string to {at commands}
isdn init	isdn reset	initialize the ISDN line
ppp iface [wan0ppp wan1ppp] ccp	ppp iface [wan0if wan1if] ccp	display CCP status to the associated iface
ppp iface [wan0ppp wan1ppp] ipcp	ppp iface [wan0if wan1if] ipcp	display IPCP status to the associated iface
ppp iface [wan0ppp wan1ppp] mp	ppp iface [wan0if wan1if] mp	display MP status to the associated iface
ppp lcp acfc [on off]	*	enable/disable PPP LCP ACFC negotiation
ppp lcp bacp [on off]	*	enable/disable PPP LCP BACP negotiation
ppp lcp callback [on off]	*	enable/disable PPP LCP Microsoft callback negotiation
ppp lcp pfc [on off]	*	enable/disable PPP LCP PFC negotiation
	sys cmgr data [bri0 bri1]	Display the device (bri0 or bri1) information
sys countrycode x	sys countrycode x	set country code to x
sys event	sys trcl call	show call trace on the screen
sys log disp	*	display the error/warning/information messages in the system log
sys log clear	*	clear the existing contents in system log
sys mbuf pool	*	display the pool of mbuf; mbuf is the buffer pre-allocated for data transmission
sys mbuf status	*	display mbuf status
sys memutil mqueue	*	statistics on pre-allocated system memory cell
sys memutil usage	*	statistics on the memory utilization
sys stdio 0	*	set SMT session timeout value to 0 -> never timeout
sys trcd	*	display the packet trace on screen
sys trcl clear	*	clear the existing contents in logic trace log
sys trcl disp	*	display the contents in both of logic and packet trace logs
sys trcl switch [on off]	*	enable/disable logic trace log mechanism
sys trcp chann [in out both enet0]	*	Enable the packet trace mechanism on incoming, outgoing, or both from WAN; or from Ethernet.
sys trcp disp	*	display the contents in packet trace log
sys trcp switch [on off]	*	enable/disable packet trace log mechanism

Notes:

- blank – no corresponding CI command
- * - no change from the previous versions.

Messages to syslogd

Prestige sends two types of messages to **syslogd** if **Syslog IP Address** field is configured. One type is the filter message if the **Log** field in Menu 21.x.y is enabled. In pre-ZyNOS versions, a message will be generated to send to syslogd for each filter rule the incoming/outgoing packet passes. In ZyNOS, there is only one message will be sent to syslogd. The message includes the header of the incoming/outgoing packet and the information about the filter rules it passes.

Another type is the call related information. In ZyNOS, the board information is added to the beginning of pre-ZyNOS messages. Otherwise, there are no other major changes.

Filter Rules

Conceptually, there are two categories of filter rules: *device* and *protocol*. The Generic filter rules belong to the *device* category; they act on the raw data from/to LAN and WAN. The IP and IPX filter rules belong to *protocol* category; they act on the IP and IPX packets.

In pre-ZyNOS versions, device and protocol (IP or IPX) filter rules could be intermixed in a filter set. This is no longer permitted in this release. This design change was provoked by the following dilemma in applying the TCP/IP filtering to SUA (Single User Account) connections:

In pre-ZyNOS versions, Prestige applied the input filter rules to the incoming packets immediately after receiving them from the ISDN line; and applied the call and output filter rules to the outgoing packets immediately prior to sending them out the ISDN port. With this approach, the call and output filter rules were applied to the output IP packets whose source IP address and port number had already been converted into different values by SUA. Thus, the call and output TCP/IP filter rules did not work for a SUA connection if the filter rules were based on the local network IP address and port number. This same limitation also applied to the input filter rules as well.

Figure 1 shows the pre-ZyNOS logic flow for a packet from LAN to WAN (->), and a packet from WAN to LAN (->). Suppose that the packet from LAN to WAN with source IP address 192.168.1.33 and port number 1023; and the WAN IP address is 203.205.115.6 that could be dynamic or static. But the port number (4034 in this example) generated by SUA is always dynamic and unpredictable. The sequence of the logic flow for the packet from LAN to WAN is:

1. LAN input filter sets.
2. SUA converts the source IP address from 192.168.1.33 to 203.205.115.6 and port number from 1023 to 4034.
3. WAN call and output filter sets. It does not work if the filter rules are based on IP address 192.168.1.33 and port number 1023.

The sequence of the logic flow for the packet from WAN to LAN is:

4. WAN input filter sets. It does not work if the filter rules are based on IP address 192.168.1.33 and port number 1023.
5. SUA converts the destination IP address from 203.205.115.6 to 192.168.1.33 and port number from 4034 to 1023.
6. LAN output filter sets.

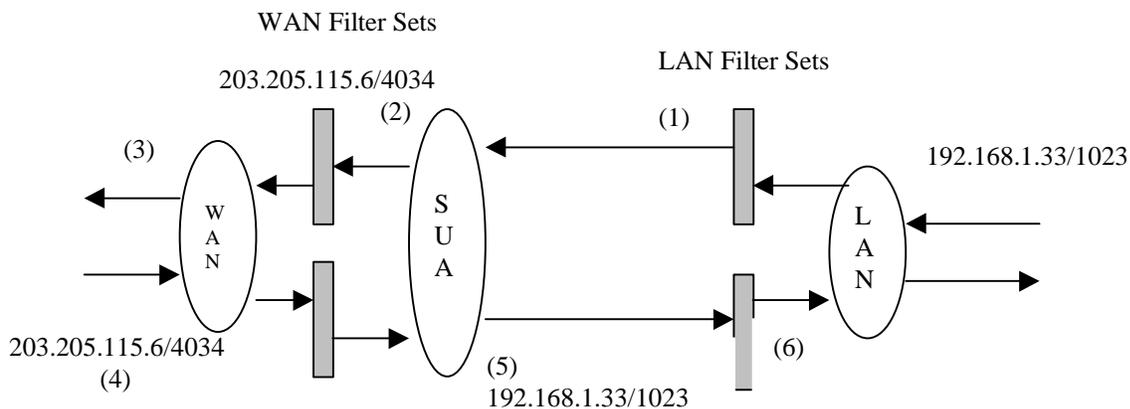


Figure 1. Packet Flow in pre-ZyNOS versions

In order to allowing users to specify the local network IP address and port number in the filter rules with SUA connections, the TCP/IP filter function has to be executed **before** SUA for WAN outgoing packets and **after** the SUA for WAN incoming IP packets. But at the same time, the Generic filter rules must be applied at the point when Prestige is receiving and sending the packets; i.e. the ISDN interface. So, the execution sequence has to be changed. The v2.20 logic flow is shown in Figure 2 and the sequence of the logic flow for the packet from LAN to WAN is:

1. LAN device and protocol input filter sets.
2. WAN protocol call and output filter sets. It works now because SUA does not convert the local IP address and port number to WAN IP address and port number yet.
3. SUA converts the source IP address from 192.168.1.33 to 203.205.115.6 and port number from 1023 to 4034.
4. WAN device output and call filter sets.

The sequence of the logic flow for the packet from WAN to LAN is:

5. WAN device input filter sets.
6. SUA converts the destination IP address from 203.205.115.6 to 192.168.1.33 and port number from 4034 to 1023.
7. WAN protocol input filter sets. It works now because SUA has converted the destination IP address and port number to local IP address and port number.
8. LAN device and protocol output filter sets.

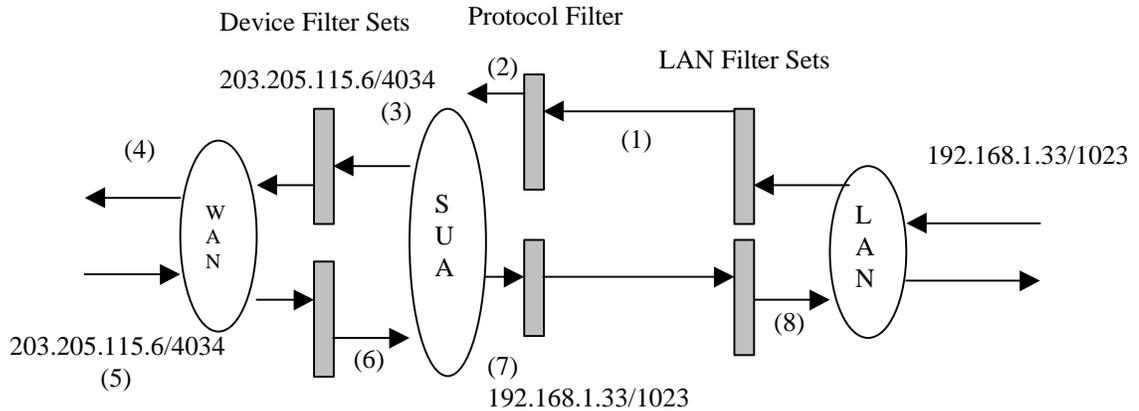


Figure 2. Packet Logic Flow in v2.20

To accommodate the above change, Generic and TCP/IP (and IPX) filter rules must now be in different filter sets. The v2.20 SMT will detect and prevent the mixing of different category rules within any filter set in Menu 21. In the following example, you will receive an error message **“Protocol and device filter rules cannot be active together”** if you try to activate a TCP/IP (or IPX) filter rule in a filter set that has already had one or more active Generic filter rules. You will receive the same error if you try to activate a Generic filter rule in a filter set that has already had one or more active TCP/IP (or IPX) filter rules.

Menu 21.1.1:

Menu 21.1.1 - Generic Filter Rule

Filter #: 1,1
 Filter Type= Generic Filter Rule
 Active= Yes
 Offset= 0
 Length= 0
 Mask= N/A
 Value= N/A
 More= No Log= None
 Action Matched= Check Next Rule
 Action Not Matched= Check Next Rule

Menu 21.1.2:

Menu 21.1.2 - TCP/IP Filter Rule

Filter #: 1,2
Filter Type= TCP/IP Filter Rule
Active= Yes
IP Protocol= 0 IP Source Route= No
Destination: IP Addr= 0.0.0.0
 IP Mask= 0.0.0.0
 Port #= 0
 Port # Comp= None
Source: IP Addr= 0.0.0.0
 IP Mask= 0.0.0.0
 Port #= 0
 Port # Comp= None
TCP Estab= N/A
More= No Log= None
Action Matched= Check Next Rule
Action Not Matched= Check Next Rule

Press ENTER to Confirm or ESC to Cancel:
Saving to ROM. Please wait...

Protocol and device rule cannot be active together

To separate the device and protocol filter categories; two new menus, Menu 11.5 and Menu 13.1, have been added, as well as some changes made to the Menu 3.1, Menu 11.1, and Menu 13. The changed fields are marked **black** in the following menus:

Menu 3.1:

Menu 3.1 - General Ethernet Setup

Ethernet Interface= 10BaseT
Input Filter Sets:
protocol filters=
device filters=
Output Filter Sets:
protocol filters=
device filters=

Menu 11.1:

Menu 11.1 - Remote Node Profile

Rem Node Name= abc	Route= IP
Active= Yes	Bridge= No
Call Direction= Outgoing	
Tunneling Mode= None	Edit PPP Options= No
Endpoint Index= N/A	Rem IP Addr= 0.0.0.0
	Edit IP/IPX/Bridge= No
Incoming:	Telco Option:
Rem Login= N/A	Allocated Budget(min)= 0
Rem Password= N/A	Period(hr)= 0
Rem CLID= N/A	Transfer Type= 64K
Call Back= N/A	Nailed-Up Connection= No
Outgoing:	Session Options:
My Login= xyxw	Edit Filter Sets= No
My Password= *****	Idle Timeout(sec)= 300
Authen= CHAP/PAP	
Pri Phone #= 140812345678	
Sec Phone #= 140822345678	

Press ENTER to Confirm or ESC to Cancel:

Menu 11.5:

Menu 11.5 - Remote Node Filter

Input Filter Sets:
protocol filters=
device filters=

Output Filter Sets:
protocol filters=
device filters=

Call Filter Sets:
protocol filters=
device filters=

Menu 13:

Menu 13 - Default Dial-in Setup	
Telco Options: CLID Authen= None	IP Address Supplied By: Dial-in User= Yes IP Pool= Yes
PPP Options: Recv Authen= CHAP/PAP Compression= Yes	IP Start Addr= 123.234.111.163 IP Count(1,2)= 2
Mutual Authen= No PAP Login= N/A PAP Password= N/A	IPX Net Num Supplied By: IPX Pool= Yes IPX Start Net Num= a0000001 IPX Count(2,16)= 2
Multiple Link Options: Max Trans Rate(Kbps)= 128	Session Options: Edit Filter Sets= No Idle Timeout= 300
Callback Budget Management: Allocated Budget(min)= Period(hr)=	

Menu 13.1:

Menu 13.1 - Default Dial-in Filter	
Input Filter Sets: protocol filters= device filters=	
Output Filter Sets: protocol filters= device filters=	

SMT will also prevent you entering a protocol filter set configured in Menu 21 to the **device filters** field in Menu 3.1, 11.5, or 13.1, or entering a device filter set to the **protocol filters** field. Even though SMT will prevent the inconsistency from being entered in v2.20, it is unable to resolve the intermixing problems existing in the filter sets that were configured before. Instead, when v2.20 translates the old configuration into the new format, it will verify the filter rules and log the inconsistencies. Please check the system log (Menu 24.3.1) before putting your device into production.

Running the Prestige with wrong filter rules may cause it to keep the ISDN line perpetually active, and/or allow undesired traffic to pass to the outside world, and receive unwanted outside traffic. The first case may incur an enormous ISDN bill; the second may be a data security hazard.

In order to avoid operational problems later, the Prestige will disable its routing/bridging functions if there is an inconsistency among its filter rules.

Proofread your filter rules even if there is no warning message in system log, and observe the router's behavior carefully after upgrading/installation.

DSS-1/1TR6 Menu 2 Changes

Menu 2 - ISDN Setup

Switch Type: DSS-1

B Channel Usage= Switch/Switch

ISDN Data = Subaddress=

A/B Adapter 1 = Subaddress=

A/B Adapter 2 = Subaddress=

PABX Outside Line Prefix=

Outgoing Calling Party Number=

Incoming Phone Number Matching= Multiple Subscriber Number (MSN)

Analog Call Routing= N/A

Global Analog Call= N/A

Edit Advanced Setup = No

The original **Dial Prefix to Access Outside Line**= field has been re-worded to **PABX Outside Line Prefix**=. Even though the wording of this field is changed, there are no impacts to the values configured before.

The next field is different. We change the way to utilize the value entered before in addition to changing the wording. The original **PABX Number (Include S/T Bus Number)**= field is replaced by **Outgoing Calling Party Number**= now. The value of this field is used as the extension number of the outgoing calling party number. Here is an example to explain the difference on how to use this field in pre-v2.20 and v2.20 versions.

The following is pre-v2.20 scenario:

Dial prefix: 0
PABX number: 12345

MSN DATA: 46
MSN a/b #1: 47
MSN a/b #2: 48

this setup caused the following ISDN initialization:

```
at&zoi=46;at&zoa=47;at&zob=48  
at&zi4=46;at&zi6=47;at&zi7=48
```

When you performed the ISDN loopback test, here were the AT strings:

```
ATD01234546 with CPN 46
```

which caused

```
RING  
FM: 067891234546  
TO: 46
```

The following is pre-v2.20 scenario:

Dial prefix: 0
PABX number: 12345

MSN DATA: 46
MSN a/b #1: 47
MSN a/b #2: 48

this setup causes the following ISDN initialization now:

```
at&zoi=12345;at&zoa=12345;at&zob=12345  
at&zi4=46;at&zi6=47;at&zi7=48
```

When you perform the ISDN loopback test, here are the AT strings:

```
ATD01234546 with CPN 12345
```

```
RING  
FM: 06789123450  
TO: 46
```

Potential Problems caused by v2.20 behavior:

- ISDN loopback test fails.
- Fail to connect to remote because remote uses CLID to perform authentication function.

Workaround:

- Remove value entered in **Outgoing Calling Party Number=** field before performing ISDN loopback test and restore it back later.
- If you want to keep the pre-v2.20 behavior, you need to use CI command: `isdn initstring set`, to overwrite the AT commands (`at&zoi`, `at&zoa`, and `at&zob`) issued by Prestige. Here is an example:

```
MSN DATA: x
MSN a/b #1: y
MSN a/b #2: z
```

issue the CI command:

```
prompt> isdn initstring set &zoi=x,at&zoa=y,at&zob=z
```

P100/P100IH ISDN EPA Mechanism is Moved to PC

The CI (Command Interpreter, menu 24.8) command, "isdn ana display", is disabled in this release. A new CI command "isdn fw ana dump" is added for displaying the ISDN raw trace data. "isdn ana display" could not work with Telnet before, but "isdn fw ana dump" works fine with Telnet. So you do not have to rely on terminal emulator via serial port to capture the ISDN trace any more.

A new DOS tool - **epapc**, will be used to decode the ISDN raw trace data into meaningful Q.921 and Q.931fields. **epapc** is part of this release. If you have difficulties to run **epapc**, please send the raw ISDN trace to ZyXEL support for decoding. The proper steps to take the raw ISDN trace are:

1. issue "isdn fw ana on" to enable ISDN trace function
2. perform the tests for capturing the interested ISDN information
3. issue "isdn fw ana off" to disable ISDN trace function
4. issue "isdn fw ana dump" to dump the ISDN trace information on screen
 - press <Enter> to display all of the ISDN trace information on screen
 - press <space bar> to display the ISDN trace information on screen page by page

Supported Platforms

V2.20 (x.01) supports Prestige models: P100, P100IH, P128+.

Enhancement Details

More Remote Nodes and IP Static Routes

In this release, the number of remote nodes and numbers of IP static routes have been increased as following:

Model	Number of remote nodes	IP static routes
P100	8	8
P100IH	8	8

P128+	12	8
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Easy Installation

Factory Default Values

Factory default values are stored in ROMFILE provided by ZyXEL. In this release, there are two ROMFILES defined: p100.rom and p128plus.rom. The factory default values in them have been optimized for Windows Internet connection. Two sets of filter rules have been configured in Menu 21 to prevent NetBIOS traffic from triggering calls. The default filters are shown below:

Menu 21:

Menu 21 - Filter Set Configuration			
Filter Set #	Comments	Filter Set #	Comments
1	NetBIOS_WAN	7	_____
2	NetBIOS_LAN	8	_____
3	_____	9	_____
4	_____	10	_____
5	_____	11	_____
6	_____	12	_____

Menu 21.1 (NetBIOS WAN):

Menu 21.1 - Filter Rules Summary		
# A Type	Filter Rules	M m n
1 Y IP	Pr=6, SA=0.0.0.0, DA=0.0.0.0, DP=137	N D N
2 Y IP	Pr=6, SA=0.0.0.0, DA=0.0.0.0, DP=138	N D N
3 Y IP	Pr=6, SA=0.0.0.0, DA=0.0.0.0, DP=139	N D N
4 Y IP	Pr=17, SA=0.0.0.0, DA=0.0.0.0, DP=137	N D N
5 Y IP	Pr=17, SA=0.0.0.0, DA=0.0.0.0, DP=138	N D N
6 Y IP	Pr=17, SA=0.0.0.0, DA=0.0.0.0, DP=139	N D F

Menu 21.2 (NetBIOS LAN):

Menu 21.2 - Filter Rules Summary		
# A Type	Filter Rules	M m n
1 Y IP	Pr=17, SA=0.0.0.0, SP=137, DA=0.0.0.0, DP=53	N D F
2 N		
3 N		
4 N		
5 N		
6 N		

The filter set, NetBIOS_LAN, is inserted in **protocol filters** field under **Input Filter Sets** in Menu 3.1 in order to prevent local NetBIOS messages from triggering calls to the DNS server.

Menu 3.1:

Menu 3.1 - General Ethernet Setup

Ethernet Interface= 10BaseT
Input Filter Sets:
 protocol filters= 2
 device filters=
Output Filter Sets:
 protocol filters=
 device filters=

The filter set, NetBIOS_WAN, is inserted in ***protocol filters*** field under ***Call Filter Sets*** in Menu 11.5 to block local NetBIOS traffic from triggering calls to ISP.

Menu 11.5 of ISP remote node:

Menu 11.5 - Remote Node Filter

Input Filter Sets:
 protocol filters=
 device filters=
Output Filter Sets:
 protocol filters=
 device filters=
Call Filter Sets:
 protocol filters= 1
 device filters=

DHCP Server

By default, Prestige is now configured as a DHCP server. The range of IP address pool is from 192.168.1.33 to 192.168.1.64. The DNS Proxy feature is enabled. Please refer to the DNS Proxy sub-section for details.

Menu 3.2:

Menu 3.2 - TCP/IP and DHCP Ethernet Setup

DHCP Setup:

DHCP= **Server**

Client IP Pool Starting Address= **192.168.1.33**

Size of Client IP Pool= **32**

Primary DNS Server= **0.0.0.0**

Secondary DNS Server= 0.0.0.0

TCP/IP Setup:

IP Address= **192.168.1.1**

IP Subnet Mask= **255.255.255.0**

RIP Direction= **Both**

Version= **RIP-1**

SUA and Dynamic IP Address

By default, both SUA and dynamic IP address are enabled. By utilizing the factory default configuration, it will be easy to most of new customers to start to browse the Internet in minutes.

Menu 4:

Menu 4 - Internet Access Setup

ISP's Name= *ChangeMe*

Pri Phone #= *1234*

Sec Phone #=

My Login= *ChangeMe*

My Password= *******

Single User Account= **Yes**

IP Addr= **0.0.0.0**

Telco Options:

Transfer Type= 64K

Multilink= Off

Idle Timeout= 300

DNS Proxy

If enabled, DNS Proxy will allow the Prestige to act as the DNS server for the local network. The Prestige will get the IP address of the actual DNS server from the remote site via IPCP negotiation. Note this feature only works if the remote site supports RFC 1877.

I. Configuring the DNS Proxy

DNS Proxy is enabled only if the selection of the **DHCP** field under **DHCP Setup** in Menu 3.1 is **Server** and the **Primary DNS Server** field in Menu 3.2 is set to **0.0.0.0**. (This is factory default). If DNS Proxy is enabled, the Prestige will assign its IP address as the Primary DNS in the responses to DHCP requests on the local network. SMT enforces the consistency between the **Primary DNS server** and **Secondary DNS server** fields in Menu 3.2 by skipping **Secondary DNS Server** field if the IP address of the **Primary DNS Server** field is 0.0.0.0.

If the selection of the **DHCP** field under **DHCP Setup** in Menu 3.1 is **None**, both of DHCP Server and DNS Proxy functions are disabled. Prestige will assign the values entered in **Primary DNS server** and **Secondary DNS server** fields in Menu 3.2 to the responses to the DHCP requests on the local network if DHCP Server function is enabled.

II. DNS Proxy Functional Flows

If DNS Proxy is enabled, Prestige will perform the following functions after receiving a DNS request from local network:

1. If there is no ISP configuration (default remote node), this DNS request packet will be discarded. Otherwise, continue.
2. Save this DNS request in an internal table.
3. If the connection to ISP is not up, Prestige will attempt to bring up the connection and negotiate with the remote site for the DNS server. Otherwise, continue.
4. If there is no DNS server negotiated on the connection to ISP, Prestige will discard this DNS request from the internal table. Otherwise, continue.
5. Replace the source IP address of the DNS request with the Prestige's own WAN IP address and forward this new DNS request to the ISP DNS server.
6. Match the DNS response from the ISP DNS server to the original DNS request in the internal table. Replace the destination IP address of the DNS response with the original client's IP address and forward this new DNS response to the original client.

Nailed-up Connection

When enabled in a remote node configuration, this node will emulate a leased line connection, even though the physical line is a dial-up connection. In this case, the Prestige will dial and hold up a connection without any traffic requesting it. This field is valid if and only if the selection of **Call Direction** field is **Outgoing**. A new option marked in **black** in Menu 11.1 enables and disables this feature.

Menu 11.1:

Menu 11.1 - Remote Node Profile	
Rem Node Name= abc	
Active= Yes	Route= IP
Call Direction= Outgoing	Bridge= No
Tunneling Mode= None	
Endpoint Index= N/A	Edit PPP Options= No
	Rem IP Addr= 0.0.0.0
Incoming:	Edit IP/IPX/Bridge= No
Rem Login= N/A	Telco Option:
Rem Password= N/A	Allocated Budget(min)= 0
Rem CLID= N/A	Period(hr)= 0
Call Back= N/A	Transfer Type= 64K
Outgoing:	Nailed-Up Connection= No
My Login= scci	Session Options:
My Password= *****	Edit Filter Sets= No
Authen= CHAP/PAP	Idle Timeout(sec)= 300
Pri Phone #= 140812345678	
Sec Phone #= 140822345678	
Press ENTER to Confirm or ESC to Cancel:	

Nailed-up Function Notes:

Because only two B-channels are available for the 8/12 remote nodes, the Prestige **always** starts to dial the first two remote nodes with the nailed-up connection requirement.

If it fails to establish a nailed-up connection (i.e. the call does not complete, or the session does not authenticate), the Prestige will keep attempting to connect to the same remote node, until the connection succeeds or exceeds the value set in **Retry Counter** field in Menu 24.9.1. This remote node is still under the budget control set in **Allocated Budget** and **Period** fields under **Telco Option** in Menu 11.1.

A remote node set as a nailed-up connection has no priority over any other remote nodes, except it keeps attempting until the connection succeeds. In other words, it is possible that other remote node connections may be established before the nailed-up connections. (i. e. -- First come, first serve.)

If a nailed-up connection is manually dropped, or lost from a line interruption, it will redial to reestablish the connection. But as above, it may fail if another other connection has already occupied the channel(s).

No idle timeout applies to nailed-up connections.

MP configuration is allowed to a nailed-up remote node. Each link of the MP will compete for the B-channel resources with other nailed-up or non-nailed-up remote node -- again first come, first serve.

Backup and Restore Configuration File via LAN or WAN

With the stand-alone Java based utility, PCT (Prestige Configuration Transfer), you can backup and restore your configuration file via LAN or WAN. Please refer to the PCT release notes for more information.

Upgrade P100IH Firmware via LAN

With PCT, you can upgrade P100IH firmware over the local LAN. (Attempting to upgrade a remote Prestige via the ISDN WAN is **not** recommended, even though it may succeed.) In this release, this feature only applies to P100IH model. Please refer to PCT release notes for more information.

L2TP support

L2TP is a standard-track tunneling protocol sanctioned by the IETF (Internet Engineering Task Force), as opposed to Microsoft's proprietary PPTP (Point-to-Point Tunneling Protocol). All the major vendors in data communications support this standard. L2TP allows users to build their own Private Networks across Internet. Rather than making a long-distance call to the corporate server, a local ISP and the Internet can be used by telecommuter or branch office to connect to corporate network. Please refer to L2TP application notes for details how to build up the channels to route IP, IPX, and Bridge packets.

Prestige provides two types of applications: Proxy mode connection and Direct mode connection. Proxy mode needs support from the ISP to achieve tunneling. However, at present, few ISP's support L2TP; so the Prestige also offers Direct mode, allowing the tunnel to be created directly between two Prestiges, without intervening ISP support.

Under Proxy mode, the Prestige can use for both end points of a L2TP tunnel, LAC (L2TP Access Concentrator) and LNS (L2TP Network Server). Below is a diagram showing how to apply the Prestiges.

P128+(A) in the above diagram is a Prestige at the ISP site. When a user's Win95 machine with ISDN TA dials into P128+(A), a tunnel is created to P128+(B) in the corporate network. Home users can then login to the corporation's IPX (Netware) servers. In this diagram, P128+(A) is the LAC and P128+(B) is the LNS, set to Proxy mode. P128+(B) is compatible with other vendors' LAC if they follow the IETF L2TP RFC.

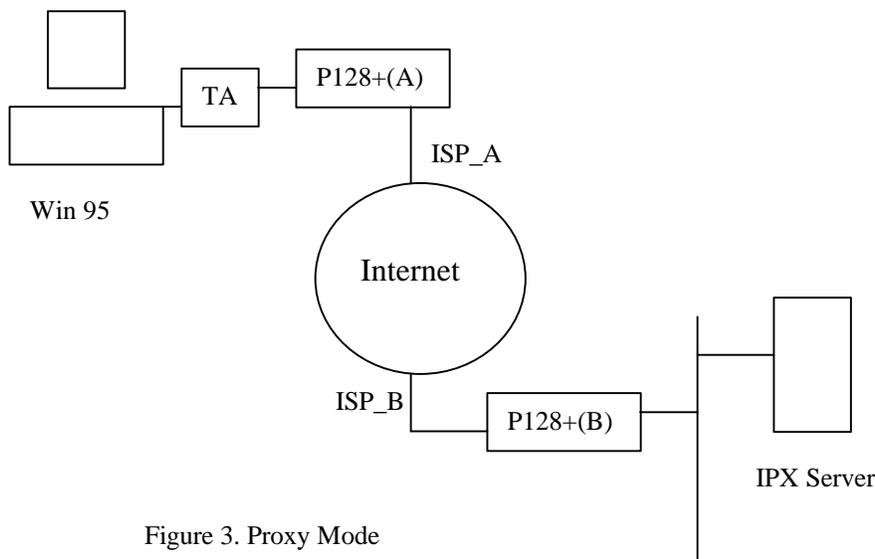
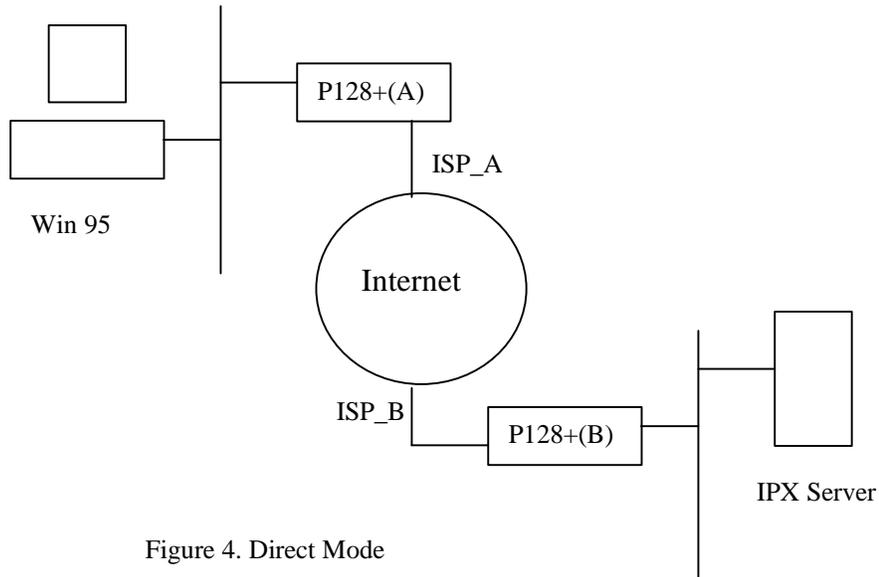


Figure 3. Proxy Mode

Under *Direct mode*, two Prestiges can create a tunnel between themselves, without needing ISP support for L2TP. See the diagram below:



The P128+(A) at home or the branch office can login to ISP_A with SUA, and when there is traffic that needs to reach the corporate IPX (Netware) server, a tunnel will be created to P128+(B). Both P128+'s need to be set to Direct Mode.

In both applications above, P128+(B) needs to have a valid {static} IP address from the Internet. This is because when the P128+(A) tries to establish a tunnel, it first needs to know P128+(B)'s IP address.

To configure the Prestige to perform L2TP, the following items must be configured:

1. L2TP tunnel endpoint: This tells Prestige the far end of the desired tunnel.
2. ISP remote node: This is the Internet access remote node.
3. A remote node using tunnel: This to route IPX through the tunnel.

Below are related changes in SMT:

Main Menu:

```
Prestige 128+ Main Menu

Getting Started                Advanced Management
 1. General Setup             21. Filter Set Configuration
 2. ISDN Setup               22. SNMP Configuration
 3. Ethernet Setup          23. System Security
 4. Internet Access Setup    24. System Maintenance

Advanced Applications
10. L2TP Endpoint Setup
11. Remote Node Setup
12. Static Routing Setup
13. Default Dial-in Setup    99. Exit
14. Dial-in User Setup

Enter Menu Selection Number:
```

Menu 10:

Four tunnel endpoint profiles can be defined in Menu 10, and each of them requires the following data:

```
Menu 10.1 - Tunnel Endpoint Profile

Endpoint Name= ?
Active= Yes
My Host Name= ?
Peer Host Name= ?
shared Secret= *****
IP Address= ?

Press ENTER to Confirm or ESC to Cancel:
```

Note:

- 'Shared Secret' must be the same in both endpoints.
- Tunnel IP address is a 'required' field in SMT. In above examples, the P128+(A) must enter the IP address of P128+(B). However, for P128+(B), since the P128+(A)'s IP address could be dynamically assigned each time a call is made to A's ISP, user can enter any IP address in this screen. P128+(B) will accept the tunnel setup request from any IP address as long as the Host Name and secret is correct.

Menu 11.1:

```
Menu 11.1 - Remote Node Profile

Rem Node Name= Corp
Active= Yes
Call Direction= Outgoing
Tunneling Mode= Direct
Endpoint Index= 2
Incoming:
  Rem Login= N/A
  Rem Password= N/A
  Rem CLID= N/A
  Call Back= N/A
Outgoing:
  My Login= user
  My Password= *****
  Authen= CHAP/PAP
  Pri Phone #= N/A
  Sec Phone #= N/A
Route= IPX
Bridge= No
Edit PPP Options= No
Rem IP Addr= N/A
Edit IP/IPX/Bridge= No
Telco Option:
  Allocated Budget(min)= 0
  Period(hr)= 0
  Transfer Type= 64K
  Nailed-Up Connection= No
Session Options:
  Edit Filter Sets= No
  Idle Timeout(sec)= 300
Press ENTER to Confirm or ESC to Cancel:
```

This is the remote node to connect to corporate network.

DSS-1 ISDN Supplemental Services

Background

Advanced ISDN Features are supported by Prestige. The relationship among the advanced ISDN features and switch types is:

Table 1. Advanced ISDN features vs. ISDN variances:

Feature:	US	DSS-1	1TR6
Incoming Call Bumping (MP)*	y	y	y
Outgoing Call Bumping (MP)*	y	y	y
Call Waiting/Call Hold/Call Retrieve	y+	y+	n
Three Way Calling (Conference/Transfer/Drop)	y+	y	n
Call Forwarding	y+	y	n
Reminder Ring	y+	n	n

Notes:

- * - feature supported since v1.3
- y+ - feature supported since v1.5
- y - feature supported in this release
- n - feature not supported

Before You Begin

ISDN Supplemental Services refers to Call Waiting/Call Hold/Call Retrieve, Three Way Calling (Conference/Transfer/ Drop), Call Forwarding, and Reminder Ring on the Prestige POTS ports. There are services on the serving Central Office switch that works in cooperation with the Prestige software must first be enabled. These services usually cost you extra charges in addition to your monthly payment.

Additional Call Offering (ACO) (in Europe the same service is better known as “Call Waiting”) is required to be subscribed on your ISDN line in order to utilizing the Call Waiting/Call Hold/Call Retrieve feature. Flexible Calling is required on your ISDN line in order to using the Three Way Calling (Conference/Transfer/ Drop) feature. You may want to check with your PTT to confirm if these services are available to you.

Call Waiting/Call Hold/ Call Retrieve

ISDN Call Waiting/Call Hold/ Call Retrieve allows user to place an active voice call on hold, switch to another call, and retrieve the original call.

Menu 2.1 -- ISDN Advanced Setup

Phone 1 Call Waiting= Enable/Disable
Phone 2 Call Waiting= Enable/Disable
Calling Line Indication = Enable/Disable

By toggling the **Phone 1 Call Waiting** and **Phone 2 Call Waiting** fields, user can enable and disable the Call Waiting/Call Hold/ Call Retrieve feature on the POTS ports. By default except France (country code 219), this feature is enabled on both POTS ports. The default value is disable to this feature if the country code is 219.

The **Calling Line Indication**, or Caller ID, governs whether the other party can see your number when you call. If set to **Enable**, the Prestige sends the caller ID and the party you call can see your number. If it is set to **Disable**, the caller ID is blocked ID and the party you call can not see your number.

How to use Call Waiting/Call Hold/ Call Retrieve feature:

- Put your current call on hold and answer the incoming call - after hearing the call waiting indicator tone, press and immediately release the flash hook button on your telephone.
- Put your current call on hold and switch to another call - press and immediately release the flash hook button on your telephone.
- Hang up your current call before answering the incoming call – hang up the phone and wait for the phone to ring. Then answer the incoming call.
- Hang up on the current active call and switch back to the other call – hang up the phone and wait for the phone to ring. Then pick up the phone to return to the other call.

Why Call Waiting does not work as expected:

1. An incoming caller will receive a busy signal if:

- you have two calls (one active and one on hold; or both actives by using Three Way Calling) on the Directory (Phone) number the incoming caller is attempting to reach.
 - you are dialing out by using the Directory (Phone) number the incoming caller is attempting to reach, but have not yet established a connection.
2. If no action is taken (call waiting indicator tone is ignored) to pickup the call, the call waiting tones will disappear after about 20 seconds.

Three Way Calling (Conference/Transfer/Drop)

The Three Way Calling feature allows you to add the third party to an existing call. This service must be subscribed from your PTT.

How to Add the Third Party to the Existing Call

- If you wish to add the third party to an existing call, the steps are:
 1. Press the flash hook button and immediately release it to put the existing call on hold and receive a dial tone.
 2. Dial the third party.
 3. Inform the third party about the conference.
 4. When you are ready to conference the call, press the flash hook button and immediately release it to establish a Three Way Conference Call.
- If you wish to cancel your attempt for some reason (the third party's line is busy, or no one answer), just hang up the phone and pick it back up after the phone ringing.

How to Remove a Party from the Three Way Calling

- If you wish to drop the last one added to the Three way calling call, just press the flash key. The last call that was added to the conference will be dropped.
- If you wish to drop yourself from the conference call, but allow the other two callers to remain connected. Just hang up your phone. If the other two remain on the line, your drop will not impact their connection.

Call Transfer

Call Transfer is a variance of Three Way and allows you to transfer an active call to a third party. If you wish to transfer an active call to a third party and inform him about the transferred call, the steps are:

1. Press flash to immediately put the existing call on hold and receive a dial tone.
2. Dial the third party.
3. Inform the third party about the transfer call.
4. Press the flash hook button and immediately release it to establish a Three Way Conference Call.
5. Hang up the phone to complete the transfer.

If you wish to do a blind transfer to the third party, the steps are:

1. Press flash to immediately put the existing call on hold and receive a dial tone.
2. Dial the third party.

3. Before the third party picks up the call, you can transfer the call by pressing the flash and hanging up. The call will be automatically transferred.

Call Forwarding

The Call Forwarding feature is supported by ISDN switch directly. The Call Forwarding feature of the POTS port can be activated and deactivated by using the phone set. The Call Forwarding is a telephone feature and will not impact incoming data call. Please request your PTT for the instruction activate or deactivate the Call Forwarding feature.

This document describes the enhancements in the ZyXEL Prestige product line since the last manual printing. The bug fixes section describes problems corrected since version 1.50.

The **New Features** section lists the features added in this release. These are detailed in the **Enhancement Details** section. Please carefully read the section, **Changes Incompatible with Previous Versions**, before installing this version.

The major enhancement in this Beta release is **DSS-1 ISDN Supplemental Services**. Please read through the **Enhancement Details** section for detail information. This document also describes the bug fixed since version 2.20 Beta 01.

Bug fixes

1. SMT menu 12.1 IP Static Route: Metric does not allow 0 any more.
2. SMT 24.2.1 Name field: used to display up to 19 characters. Now it can display up to 30 characters.
3. Prestige used to report 0 for both of the ISDN iface inUnicast and outUnicast counters. Prestige reports the right number now.
4. In this release, rotate is the default mode for MP.
5. Add Idle Time-out field in the Menu 4.
6. There existed a bug in Menu 2 for DSS-1 and 1TR6 versions. The number of **Dial Prefix** field would be changed to the combination of the number entered in both **Dial Prefix** and **PABX Number** fields if the number entered in **Dial Prefix** field was 4 digits. This bug is fixed.
7. Prestige used to have problems to support Unix remote commands in SUA case. This version is capable to support rlogin and rcp even though it still has difficulty to support rsh.
8. The value selected in **Max Trans Rate** field of Menu 13 is used by BACP (Bandwidth Allocation Control Protocol) to decide whether to allow MP (Multilink Protocol) for a dial-in user (not remote node). But Prestige did not reject the bundling request if the far-end either ignored what negotiated in BACP or did not negotiate BACP at all. In this release, a new CI command, ppp lcp mpin on/off, is added to allow user to enable/disable a new mechanism to prevent the far-end requesting for MP no matter whether the incoming call to a dial-in user or remote node. By default, Prestige allows the far-end requesting for MP. After entering the CI command, ppp lcp mpin off, the Prestige is set to preventing the far-end to request for MP.
9. There are two messages are added to send to Unix syslogd. The first message is the ISDN link on, and the second one is ISDN link off.
10. In this release, IP address, 0.0.0.1, is not allowed in Menu 13.
11. CHAP used to fail if the length of password exceeds 15 characters. It is fixed.
12. For French (country code 219) version, defaults for **Call Waiting** fields in Menu 2.1 are **Disable** now.
13. The **Call Direction** field in Menu 11.1 is restored after toggling through the **Leased** option in **Transfer Type** field.
14. In this version, it is allowed to enter any ASCII character to **Pri Phone #** and **Sec Phone #** fields in both Menu 4 and 11.1.

15. The digital ISDN Global calls will be ignored if the if **MSN** is the selection of the **incoming call matching** method in Menu 2 and the S register is set to S120.4=1. The CI command to set S register is:

prompt> isdn initstring set s120.4=1

16. Add Spain phone ring cadence to the ISDN ring table.

Known Problem List

1. For Northern American version, the Prestige may drop both data channels if both of the POTS port telephones are off hook simultaneously while an MP call is in progress.
2. If Prestige connects to the switch that does not support in-band tone, the tone will be generated by Prestige instead. In this case, Prestige will send the same tone to both POTS ports. For example, when telephone 1 (telephone connects to POTS port 1) is ringing, off-hooking telephone 2 (telephone connects to POTS port 2) will cause telephone 1's sound changing from ring to dial tone. It is because Prestige generates dial tone for POTS port 2 now.
3. The POTS port (A/B adapter) dial tone may disappear if call bumping is attempted twice in rapid succession on a switch that does not support in-band tone.
4. For DSS-1 version, the ISDN **Link** status still shows **Idle** in Menu 24.1 even if the cable is unplugged.
5. For DSS-1 version, Prestige may stop placing outgoing data calls after Call Waiting/Call Hold/ Call Retrieve scenario if both of POTS ports are assigned the identical phone number. When it happens, the B-channel status shown on Menu 24.1 is wrong.
6. For the Northern American version, it may have problems to place voice call to far-end (hear busy tone) via second POTS ports even though it works by using the first POTS port.
7. Prestige performance will be degraded if there exists a telnet session in Menu 24.1 via LAN at the same time.
8. All of the incoming analog calls will be treated as DOVBS if the selection for either of the **Incoming Analog Call** field in Menu 2 is DOVBS.

To Upgrade Prestige

Get the files from ZyXEL anonymous FTP server (ftp.zyxel.com). Upgrade your Prestige by following the instructions for your model:

P100

Versions:

RAS S/W Version - V2.20(C.15) | 3/6/99
ISDN F/W Version - DSS1: V 083
1TR6: V 083
USA : V 083

RAS and ISDN firmware files:

p100a.bin (for Northern America)
p100e.bin (for DSS1)
p100g.bin (for 1TR6)

Commands:

ATBAx: Where x = baud rate
options available are:
1= 38.4K
2= 19.2K

3= 9.6K
4= 57.6K
5= 115.2K

ATUR: Upload Firmware file via XMODEM

Romfile: p100.rom

ATUR3: Upload Romfile and reset configuration to factory default

Note: You don't need to upload this file if you are upgrading the Prestige from pre-ZyNOS releases. You need to upload this file if you are upgrading the Prestige from 2.20(C.00)b01 release or you want to reset all configurations to factory default.

P100IH

Versions:

RAS S/W Version - V2.20(G.15) | 3/6/99
ISDN F/W Version - DSS1: V 083
1TR6: V 083
USA : V 083

RAS and ISDN firmware files:

p100iha.bin (for Northern America)
p100ihe.bin (for DSS1)
p100ihg.bin (for 1TR6)

Commands:

ATBAx: Where x = baud rate
options available are:
1= 38.4K
2= 19.2K
3= 9.6K
4= 57.6K
5= 115.2K

ATUR: Upload Firmware file via XMODEM

Romfile: p100.rom

ATUR3: Upload Romfile and reset configuration to factory default

Note: You don't need to upload this file if you are upgrading the Prestige from pre-ZyNOS releases. You need to upload this file if you are upgrading the Prestige from 2.20(G.00)b01 release or you want to reset all configurations to factory default.

P128+

Versions:

RAS S/W Version - V2.20(B.15) | 3/6/99
ISDN F/W Version - DSS1: V 083
1TR6: V 083
USA : V 083

RAS and ISDN firmware files:

p128a.bin (for Northern America)
p128e.bin (for DSS1)
p128g.bin (for 1TR6)

Commands:

ATBAx: Where x = baud rate

options available are:

1= 38.4K

2= 19.2K

3= 9.6K

4= 57.6K

5= 115.2K

ATUR: Upload Firmware file via XMODEM

Romfile: p128plus.rom

ATUR3: Upload Romfile and reset configuration to factory default

Note: You don't need to upload this file if you are upgrading the Prestige from pre-ZyNOS releases. You need to upload this file if you are upgrading the Prestige from 2.20(B.00)b01 release or you want to reset all configurations to factory default.

Abbreviations and Acronyms:

IETF: Internet Engineering Task Force

L2TP: Layer 2 Tunneling Protocol

LAC: L2TP Access Concentrator

LAN: Local Area Network

LNS: L2TP Network Server

PPTP: Point-to-Point Tunneling Protocol

RFC: Request For Comment

WAN: Wide Area Network