NORTEL NETWORKS

Passport 6400

Passport 4400 and 6400 Quick Start Guide

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About this document

This document covers the basic provisioning needed to bring up a Multiservice Passport Access Network Link (MPANL) between a Passport 4400 and 6400.

Also included is a section on establishing a network management connection to the 4400, and a section on configuring the RSI -RSA components required for voice networking.

How this document is setup

Each section includes an example configuration with typical variables. The commands that follow use the variables from the example. When you use the commands, replace the example variables with variables unique to your network setup.

The examples and commands use and assume default values wherever possible.

When to use this document

The provisioning in this guide occurs after

- the 4400 expansion modules are installed, the box is installed and the cables connected
- the 6400 cards are installed, software downloaded, cables connected and a network management station has access to the node

Related documents

This document uses commands and information found in the Passport 4400 and 6400 suite of documents. When you require additional information, consult the following documents:

Passport 4400

800-1943-20, *Analog Voice Manual*

800-1944-20, *T1/E1 and DVM Manual*

800-1951-20, *Hardware Manual*

800-1950-20, *CLI Reference*

800-1952-20, *Operator's Manual*

Passport 6400

241-6401-275 *Passport 6400 NMS Connectivity Guide*

241-6401-050 *Passport 6400 Commands*

241-6401-765 *Passport 6400 Remote Server Agent Guide*

241-6401-480 *Passport 6400 Multiservice Passport Access Network Link Guide*

241-6401-755 *Passport 6400 Voice Networking Guide*

241-6401-115 *Passport 6400, 4400 Interworking Guide*

Logging onto the Passport switches

Log onto the Passport 4400

1. Connect the supplied RJ45 cable from the serial port on your computer or teminal to the local management port on the 4400.
2. Open a terminal emulation session with the following settings

   Data Rate: 9600 bps
   Data Bits: 8
   Stop Bits: 1
   Parity: None

   The port is self sensing. A welcome screen and command line prompt appears.
3. Log onto the Command Line Interface (CLI)

   ```
   > cli
   ```

   Ignore the password prompt and hit the <enter> key.
4. Reload the default settings into memeory. This command is optional.

   ```
   CLI> reset system default reset
   ```

Log onto the Passport 6400

This document assumes that a network management workstation is already connected to either the 6400 locally, or is connected to the Passport Network and can access the 6400 remotely.

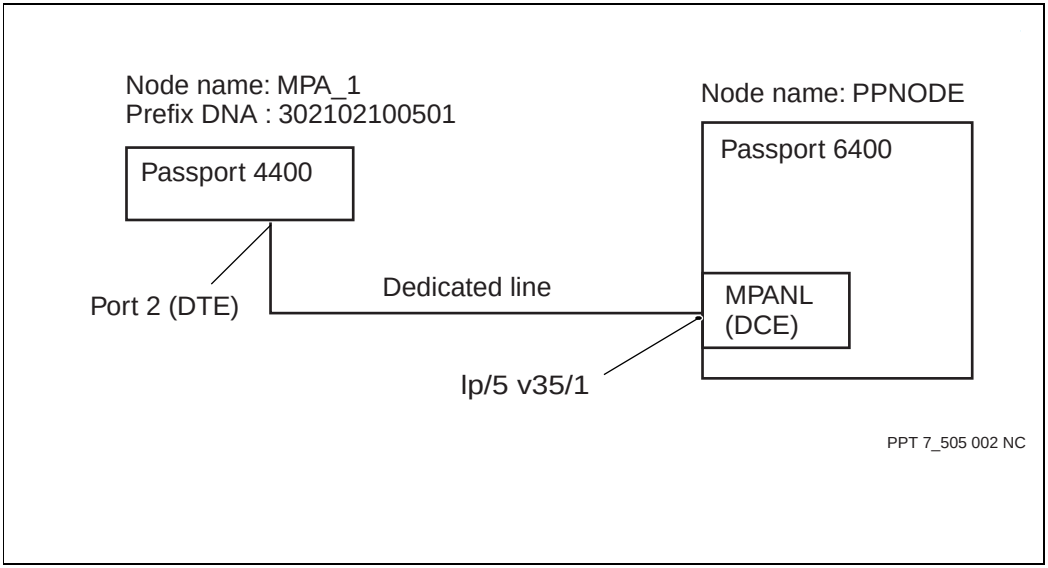
This assumption is based on the usual practice of deploying and setting up the Passport 6400 nodes prior to the deployment of the 4400s.

Configuring an MPANL over a dedicated line

Figure 1 shows an example of MPANL over a dedicated line. The commands that follow use the variables from this example. When you configure your MPANL, replace the example variables with variables unique to your network setup.

The example shows the two Passports as co-located for the sake of simplicity. However, a dedicated line to a remote 4400 typically travels through a variety of facilities.

Figure 1
MPANL over a dedicated line



Configure the 4400

```
CLI> def msm profile dnaPrefix "302102100501"
```

The Prefix DNA normally derives from link information.
For example:

```
DNIC 3021
RID 02
MID 10
Lp 05
Port 01
```

```
CLI> set system administration nodename "MPA_1"
```

You do not require a nodename, but it is typically included. Although not shown in this example, the nodename appears within the prompt.

```
CLI> save config update
```

```
CLI> reset system current reset
```

Configure the 6400

```
> start prov
```

```
PROV> add sw lpt/MPANL_DED
```

```
PROV> set sw lpt/MPANL_DED featureList mpaNetworkLink
frameRelayUniPvcSvc frameRelayMmtc
```

```
PROV> check prov
```

```
PROV> act prov
```

```
PROV> save prov
```

```
PROV> add sh card/5
```

```
PROV> set sh card/5 cardType v35
```

```
PROV> add lp/5
```

```
PROV> set lp/5 logicalProcessorType Sw Lpt/MPANL_DED
```

```
PROV> set lp/5 mainCard sh card/5
```

```
PROV> add lp/5 V35/1
```

```
PROV> set lp/5 v35/1 linkMode dce
```

```
PROV> set lp/5 v35/1 lineSpeed 64000
```

Note: The 6400 needs to match the 4400 linespeed. This example uses the 4400's default setting of 64 kb/s.

```
PROV> add mpanl/51
PROV> add mpanl/51 framer
PROV> set mpanl/51 framer int lp/5 v35/1
PROV> check prov
PROV> act prov
PROV> save prov
PROV> commit prov
PROV> end prov
```

Verifying the MPANL connection

Once the provisioning is complete on both the 4400 and 6400, verify the link.

On the 4400

From the 4400, verify the link is operational using the following command to list the link overview information.

```
CLI> show msm linkstatus table

IfIndex            : 149
InterfaceType      : dte
LAPFStatus         : up
LocalComponentName : "MPA_1 MPANL/149"
RemoteComponentName: "PPNODE Mpanl/51 SigMpanl"
RemoteGenCfgType   : nortelAccessDevice
PANLStatus         : up
```

When the MPANL is up, local and remote node names are displayed. The LAPF and PANL status display as up.

If using a 2.0 release, use the following command:

```
CLI> show msm dtelinkstatus table

IfIndex            : 149
LAPFStatus         : up
LocalComponentName : "MPA_1 MPANL/149"
RemoteComponentName: "PPNODE Mpanl/51 SigMpanl"
```

From the 6400

From the 6400 workstation, verify the link is operational using the following commands to display link a variety of information:

> d lp/5 v35/1

Unlocked and enabled.

> d mpanl/51 sig

Unlocked and enabled.

> d mpanl/51 framer

Unlocked and enabled.

> d mpanl/51 sigm

Unlocked and enabled;
dteComponentName - "MPA_1";
CurrentState - informationTransfer.

> d mpanl/51 prefixDna/*

"302102100501"

Troubleshooting the MPANL connection

If your MPANL fails to come up, check the following items.

From the 4400

Check all cabling. Ensure all cables are correct for the interface type and mode.

Use the following commands to check the operational state of the MPANL connection:

CLI> show wan stat port t

Verify there are no link over or under runs, link errors or bad packets.

CLI> show msm profile

Verify the Prefix DNA is configured correctly.

CLI> show fr line user dlcmiPVC operational table

Verify LMI type is set to none.

From the 6400

Check all cabling . Ensure all cables are correct for the interface type and mode.

Check the Passport patch panel connections.

Use the following commands to check the operational state of the MPANL service:

> d lp/5 v35/1

Unlocked and enabled.

> d mpanl/51 sig

Unlocked and enabled.

> d mpanl/51 framer

Unlocked and enabled;
Verify frames are being sent to/from the interface.

> d mpanl/51 sigm

Unlocked and enabled;
dteComponentName - “MPA_1”;
currentState - informationTransfer.

>d mapanl/51 prefixDna/*

Verify the 4400 PrefixDna is listed.

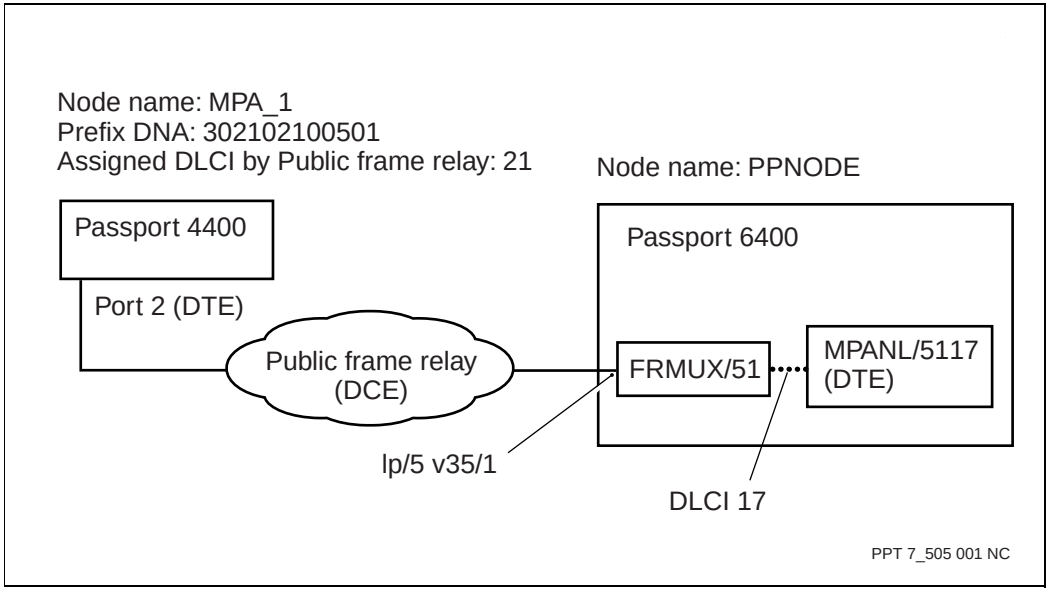
>d lp/5 v35/1

Verify linespeed is set to “64000” b/s and the mode is set to DCE.

Configuring an MPANL tunneled through public frame relay

Figure 2 shows an example of MPANL tunneled through public frame relay. The commands that follow use the variables from this example. When you configure your MPANL, replace the example variables with variables unique to your network setup.

Figure 2
MPANL tunneled through public frame relay



Configure the 4400

CLI> def msm profile dnaPrefix "302102100501"

The Prefix DNA normally derives from link information.
For example:

```
DNIC   3021
RID    02
MID    10
Lp     05
Port   01
```

CLI> set system administration nodename "MPA_1"

A nodename is not required, but is typically included. Although not shown in this example, the nodename appears within the CLI prompt.

CLI> def fr tunnel 149

CLI> add fr tunnel 149 21 limi 2 dtepanl

CLI> def fr line user dlcmipvc 155 ansi

If using release 2.0, use the following two commands in place of the previous three commands:

```
CLI> def fr line user dlci lmitype 155 ansiT1617D-1994
CLI> define wan tunnelPVC dlci 153 21
```

where:
the 3rd party frame relay network supplies the DLCI number

CLI> save config update

CLI> reset system current reset

Configure the 6400

> start prov

PROV> add sw lpt/MPANL_MUX

PROV> set sw lpt/MPANL_MUX **featureList mpaNetworkLink frameRelayMux frameRelayUni frameRelayMmtc**

PROV> check prov

PROV> act prov

PROV> save prov

```
PROV> add sh card/5
PROV> set sh card/5 cardType v35
PROV> add lp/5
PROV> set lp/5 logicalProcessorType Sw Lpt/MPANL_MUX
PROV> set lp/5 mainCard sh card/5
PROV> add lp/5 V35/1
PROV> set lp/5 v35/1 linkMode dce
PROV> set lp/5 v35/1 lineSpeed 64000
```

Note: Linespeed is the aggregate of all 4400s connecting to this port. For example, if you added a second MPANL with a linespeed of 64000 to this port, the linespeed in the command becomes 128000.
This document's example uses the 4400 default value of 64 Kb/s. Normally, linespeed is negotiated with the third party network provider.

```
PROV> add frmux/51
PROV> set frmux/51 framer int lp/5 v35/1
PROV> set frmux/51 lmi procedures ansi
```

Assumes the third party Frame Relay Network uses an ANSI LMI protocol.

```
PROV> add frmux/51 dlci/17
PROV> add mpanl/5117
PROV> add mpanl/5117 FrMuxSetup
PROV> set mpanl/5117 FrMuxSetup PvcSetup dlciName
frmux/51 dlci/17 ApplInfo
```

Note: Each additional instance of MPANL to frmux/51 requires a separate DLCI, as provisioned in the above four commands.

```
PROV> check prov
PROV> act prov
PROV> save prov
PROV> commit prov
```

```
PROV> end prov
```

Verifying the MPANL connection

Once the provisioning is complete on both the 4400 and 6400, verify the link.

On the 4400

```
CLI> show msm linkstatus table

IfIndex            : 149
InterfaceType      : dte
LAPFStatus         : up
LocalComponentName : "MPA_1 MPANL/149"
RemoteComponentName: "PPNODE mpanl/5117 SigMpanl"
RemoteGenCfgType   : nortelAccessDevice
PANLStatus         : up
```

When the MPANL is up, the local and remote node names are displayed. The LAPF and PANL status display as up.

Note: If using a 2.0 release, use the command:

```
CLI> show msm dtelinkstatus table

IfIndex            : 155
LAPFStatus         : up
LocalComponentName : "MPA_1 MPANL/155"
RemoteComponentName: "PPNODE mpanl/5117 SigMpanl"
```

On the 6400

```
> d lp/5 v35/1
```

Unlocked and enabled.

```
> d frmux/51
```

Unlocked and enabled.

```
> d frmux/51 lmi
```

Unlocked and enabled;
protocolStatus - normalCondition.

```
> d frmux/51 framer
```

Unlocked and enabled;
no errors displayed;
frames being sent to/from the interface.

```
> d frmux/51 dlci/17
```

Unlocked and enabled;
usageState - busy;
aBitStatusFromIf - active.

```
> d mpanl/5117 sig
```

Unlocked and enabled.

```
> d mpanl/5117 sigm
```

Unlocked and enabled,
dteComponentName - "MPA_1",
currentState - informationTransfer.

```
> d mpanl/5117 prefixDna/*
```

```
“302102100501”
```

Troubleshooting the MPANL connection

If your MPANL does not come up:

On the 4400

Check all cabling. Ensure all cables are correct for the interface type and mode.

Ensure the connection to the 3rd party frame relay network is correct.

Ensure the LMI protocol is set to that of the frame relay network.

```
CLI> show wan port t
```

Verify there are no link over or under runs, link errors or bad packets.

```
CLI> show msm profile
```

Verify the Prefix DNA is configured correctly.

```
CLI>show fr line user dlcmiPVC operational table
```

Verify your tunnelling DLCI matchs that of the Frame Relay network.

On the 6400

Check all cabling. Ensure all cables are correct for the interface type and mode.

Check the Passport patch panel connections

Check the operational status of the framer

```
> d mpanl/5117 framer
```

Unlocked and enabled;
verify that frames are being sent to/from the interface.

Configuring a network management connection to a 4400

The objective of this section is to enable network management connectivity between a network management terminal and the Passport 4400. Once connected, a network operator at the terminal can open a telnet or NMS session to the 4400 for further provisioning and surveillance. The network management terminal can be located anywhere in the network.

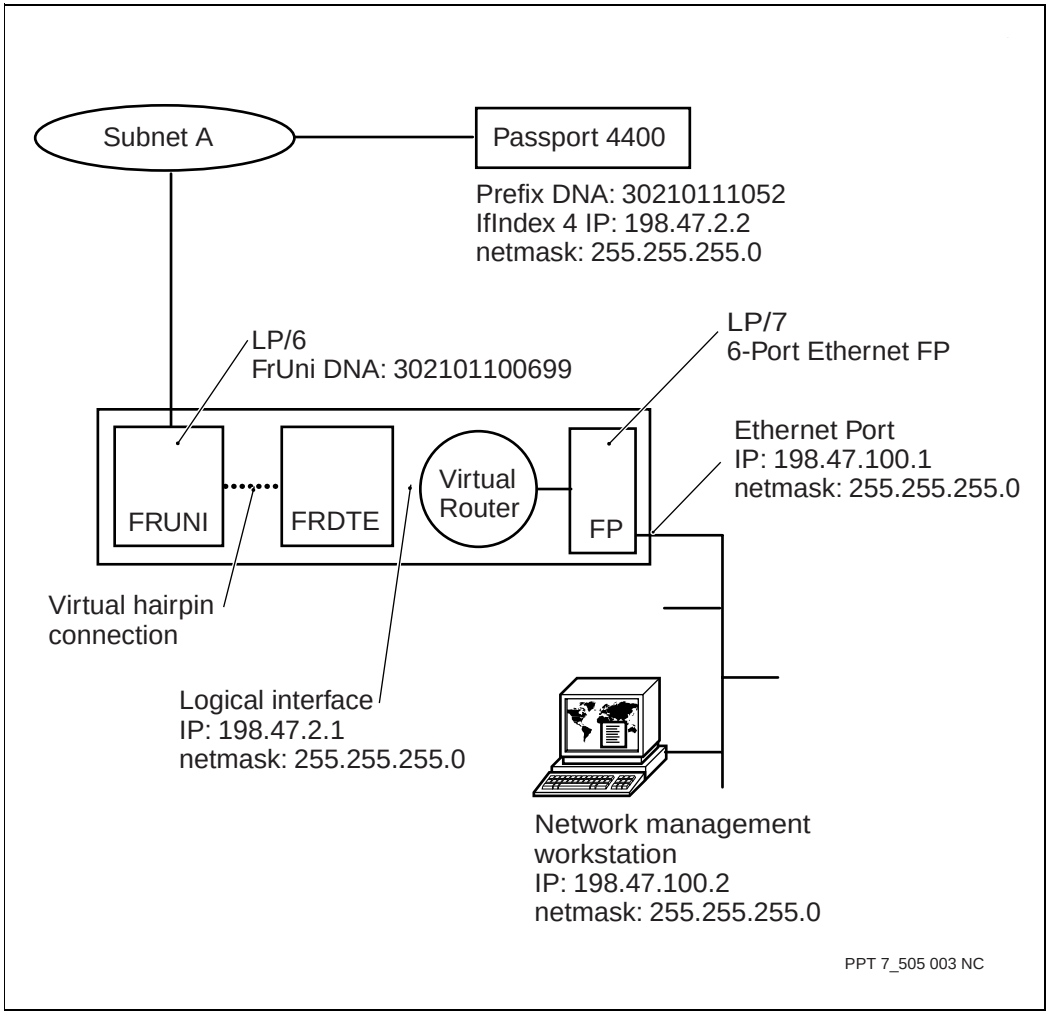
The 6400 commands assume the network management core router (NMCR) is not yet set up. However, in a typical Passport network, the 6400 nodes are up and running prior to 4400 deployment.

Note:

- A single FRUNI interface can be used for multiple Passport 4400s. However, each 4400 requires its own SPVC connection to the network management core router (configured as an ILS virtual router).
- This section assumes the 4400 has an active MPANL into the Passport network.

Figure 3 shows an example of a network management connection to a Passport 4400. The commands that follow use the variables in this example. When you configure your network management connection, replace the example variables with variables unique to your network setup.

Figure 3
Network management connection to a 4400



Configure the 4400

```
CLI> define bridge global ipProtocol routed

CLI> add ip address entry 4 198.47.2.2 255.255.255.0
198.47.2.255

CLI> define ip base parameter dataLinkType 4 198.47.2.2
fr

CLI> define ip base parameter routeProtocolType 4
198.47.2.2 passiveRip
```

Note: The above two commands use the 3.1 command format of CLI> def ip base para <command> <IfIndex> <IP Address> <option>

```
CLI> define ip base rip on

CLI> define ip invArp 4 ip enabled

CLI> add fr port spvc 4 17 "302101100699" master

CLI> save config update

CLI> reset system current reset

CLI> add ip route 198.47.100.0 4 2 198.47.2.1
255.255.255.0

CLI> save configuration update

CLI> reset system current reset
```

Configure the 6400

```
> start prov

PROV> add sw lpt/ENET

PROV> set sw lpt/ENET featureList ip

PROV> add sh card/7

PROV> set sh card/7 cardType 6pEth10BaseT

PROV> add lp/7

PROV> set lp/7 lpt sw lpt/ENET

PROV> set lp/7 mainCard sh card/7

PROV> add sw lpt/FRIP
```

```
PROV> set sw lpt/FRIP featureList frsVirtualFramer
frameRelayUniPvcSvc frameRelayDte ip

PROV> add sh card/6

PROV> set sh card/6 cardType v35

PROV> add lp/6

PROV> set lp/6 lpt sw lpt/FRIP

PROV> set lp/6 mainCard sh card/6

PROV> ch prov

PROV> act prov

PROV> save prov
```

Add the FRUNI

```
PROV> add fruni/699

PROV> set fruni/699 dna dataNetworkAddress
302101100699

PROV> delete fruni/699 framer

PROV> add fruni/699 vframer

PROV> set fruni/699 vframer logicalProcessor lp/6
```

Add the FRUNI DLCI

```
PROV> add fruni/699 dlci/17
```

The above command assigns a DLCI of 17 for network management traffic. Each 4400 must have a unique DLCI.

```
PROV> set fruni/699 dlci/17 dc remoteDna
302101100501101
```

302101100501101 is the PrefixDna of the 4400 with the 101 suffix added to indicate network management traffic.

```
PROV> set fruni/699 dlci/17 dc remoteDlci 16
```

Note: The remote DLCI is always 16 for MPANL.

```
PROV> set fruni/699 dlci/17 dc type permanentSlave
```

Add the FRDTE

```
PROV> add frdte/699

PROV> delete frdte/699 framer

PROV> add frdte/699 vframer

PROV> set frdte/699 vframer logicalProcessor lp/6

PROV> add frdte/699 staticDlci/100
```

The above command creates a static DLCI between the FRUNI service and the FRDTE. Each 4400 in the network requires a unique DLCI.

```
PROV> set frdte/699 vframer otherVirtualFramer fruni/
699 vframer
```

Add the Virtual Router

```
PROV> add vr/1

PROV> add vr/1 ip

PROV> add vr/1 ip rip

PROV> add vr/1 pp/frdte699rg1

PROV> add vr/1 pp/frdte699rg1 ipp

PROV> set vr/1 pp/frdte699rg1 linkToMedia frdte/699
rg/1
```

rg/1 (remoteGroup) is created by default. Additional remote groups need to provisioned.

```
PROV> set frdte/699 rg/1 LinkToFrDteDlci frdte/699
stdlci/100
```

The above command links the static DLCI to the remote group containing the 4400. This command must be repeated for each 4400 connected to a 6400 network node.

```
PROV> set vr/1 pp/frdte699rg1 LinkToMedia frdte/699
rg/1

PROV> add vr/1 pp/frdte699rg1 ipp logicalIf/198.47.2.1

PROV> set vr/1 pp/frdte699rg1 ipp logicalIf/198.47.2.1
broadcastAddress 198.47.1.255
```

```
PROV> set vr/1 pp/frdte699rg1 ipp logicalIf/198.47.2.1
netMask 255.255.255.0

PROV> add vr/1 pp/frdte699rg1 ipp logicalIf/198.47.2.1
rip

PROV> add vr/1 pp/frdte699rg1 ipp logicalIf/198.47.2.1

PROV> add vr/1 pp/ENET70

PROV> add vr/1 pp/ENET70 ipp

PROV> add vr/1 pp/ENET70 ipp logicalIf/198.47.100.1

PROV> set vr/1 pp/ENET70 ipp logicalIf/198.47.100.1
broadcastAddress 198.47.100.255

PROV> set vr/1 pp/ENET70 ipp logicalIf/198.47.100.1
netMask 255.255.255.0

PROV> add vr/1 pp/ENET70 ipp logicalIf/198.47.100.1
rip
```

Add the Ethernet Port

```
PROV> add lp/7 enet/0

PROV> add lan/70

PROV> set lan/70 linkToProtocolPort vr/1 pp/ENET70

PROV> set lan/70 framer interfaceName lp/7 enet/0

PROV> check prov

PROV> act prov

PROV> save prov

PROV> commit prov

PROV> end prov
```

Add the 4400 to the IP Routing table

Execute the following UNIX command on the NMS or other workstation.

```
unix> route add 148.47.2.0 148.47.100.1
```

Verifying the network management connection

Verify you have network managment connectivity after configuring the connection.

On the 4400

CLI> show ip route table

Shows all networks the 4400 can identify. Ensure an entry for the static route is displayed.

CLI> ping <destination ip address>

Confirms whether the connection to the specified IP address is up.

CLI> show fr port spvc circuit table

Shows the SPVC if it is active to the Passport FRUNI.

On the 6400

> d vr/1 ip fwd/*

Shows all networks the Passport ILS can see. If RIP is disabled your Network Management subnets may not show up here.

> d vr/1 ip rdb/*

Shows the routing database of the ILS. If RIP is disabled your Network Management subnets may not show up here.

> ping -ip(<destination ip address>) vr/1 ip icmp

Ping's the specified address.

> d fruni/699 dlci/17

A-bit status active to/from interface indicates the SPVC is up.

> d frdte/699 rg/1

Unlocked and enabled.

> d vr/1 pp/frdte60rg1 ipp

Unlocked and enabled.

Configuring the RSI - RSA connection

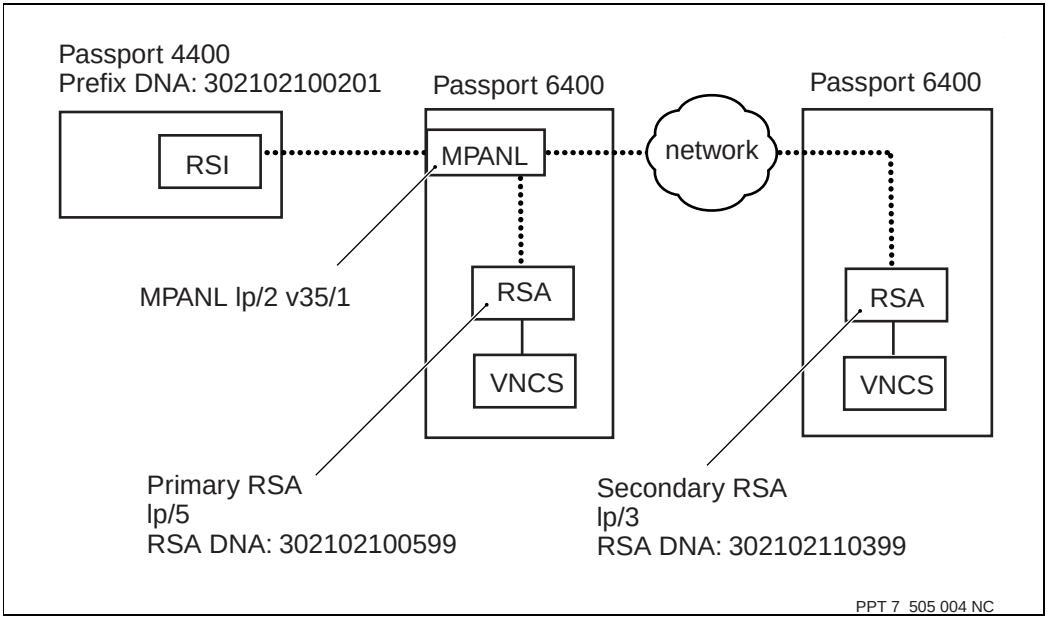
Voice networking requires the provisioning of the Remote Server Interface (RSI) on the 4400 and the Remote Server Agent (RSA) on the 6400. Together they form the connection that allows the 4400 access to the voice networking call server (VNCS) on the 6400. Both digital and analogue voice networking require an RSI - RSA connection.

Note the following when configuring the connection:

- A typical network has multiple RSAs for load sharing and backup purposes. The following example also uses this approach.
- You can locate the RSA on any 6400 in the network. However, the RSA and VNCS must be on the same shelf.
- The RSA should be configured on its own function processor.

Figure 4 shows an example of an RSI - RSA configuration. The commands that follow use the variables from this example. When configuring your network, replace the example variables with variables unique to your network setup.

Figure 4
A simplified RSI - RSA configuration example



Configuring the RSI and RSAs

On the 4400

```
CLI> add voice switch

CLI> add server 1 vncs

CLI> add rsi server 302102100599 Prim-RSA5 primary

CLI> add rsi server 302102110399 Secon-RSA3 secondary

CLI> save config update

CLI> reset system cpu reset
```

On the 6400 hosting the primary RSA

```
PROV> add shelf card/5

PROV> set shelf card/5 cardType v35

PROV> add lp/5

PROV> set lp/5 mainCard sh card/5
```

```
PROV> add sw lpt/RSA
PROV> set sw lpt/RSA featureList serverAccessRsa
PROV> set sw lpt/CP featurelist vncsCallServer
PROV> set lp/5 logicalProcessorType sw lpt/RSA
PROV> check prov
PROV> act prov
PROV> save prov
PROV> add rsa/5
PROV> set rsa/5 logicalProcessor lp/5
PROV> set rsa/5 dna dataNetworkAddress 302102100599
PROV> add rsa/5 vncsAccess
PROV> check prov
PROV> act prov
PROV> save prov
```

On the 6400 hosting the secondary RSA

```
PROV> add shelf card/3
PROV> set shelf card/3 cardType v35
PROV> add lp/3
PROV> set lp/3 mainCard sh card/3
PROV> add sw lpt/RSA
PROV> set sw lpt/RSA featureList serverAccessRsa
PROV> set sw lpt/CP featurelist vncsCallServer
PROV> set lp/3 logicalProcessorType sw lpt/RSA
PROV> check prov
PROV> act prov
PROV> save prov
PROV> add rsa/3
PROV> set rsa/3 logicalProcessor lp/3
```

```
PROV> set rsa/3 dna dataNetworkAddress 302102110399
PROV> add rsa/3 vncsAccess
PROV> check prov
PROV> act prov
PROV> save prov
```

Verifying the RSI - RSA connection

After both the RSI and RSA are configured, verify the connection is up.

On the 4400

```
CLI> show rsi server operational table
```

Verify the availability status shows available.

On the 6400 with the primary RSA

```
> d rsa/5
```

Verify the RSA is enabled.

```
> d rsa/5 VncsAccess
```

Unlocked and enabled.

```
> d rsa/5 Connection/*
```

Verify output displays remote RSI name.

On the 6400 with the secondary RSA

```
> d rsa/3
```

Verify the RSA is enabled.

```
> d rsa/3 VncsAccess
```

Unlocked and enabled.

```
> d rsa/3 Connection/*
```

Verify output displays remote RSI name.

Passport 6400

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