NORTEL

Media Gateway 3200

H.248 Configuration Guide - IUA & ISUP

Version SN09

Document # LTRT-72904 Rev 008

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Abbreviations

Each abbreviation, unless widely used, is spelled out in full when first used. Only industry-standard terms are used throughout this manual. Hexadecimal notation is indicated by 0x preceding the number.

Related Documentation

Document #	Manual Name
LTRT-727xx (e.g., LTRT-72701)	MG 3200 H.248 User's Manual
LTRT-738xx	MG 3200 H.248 & SIP Fast Track Installation Guide

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1 MG 3200 Configuration Guide for H.248 Application

1.1 Purpose

The purpose of this document is to provide information about the configuration settings for the Nortel Media Gateway MG 3200 as used in the Nortel CS2K and SL100 solutions. This document discusses the default settings that are set for each MG 3200 and the basic configuration steps and parameters to use in setting up the various control protocols and TDM side configurations. This documentation details the provisioning method to be used by Nortel to reduce or eliminate the need for manual changes to the initialization file.

1.2 Introduction

The Nortel product lines are used in a wide variety of applications. In order to have the flexibility to handle this, configuration parameters are used to set the box up for its role in the different applications. For the Nortel applications, the Nortel designers have defined values for a set of parameters that allow inter-working between the MG 3200 and other Nortel equipment. These default parameters are downloaded to the system through a configuration file referred to as the "*ini*" (initialization) file. The parameters are set in the runtime memory immediately following the loading of the compressed executable ('*cmp*') file. In most cases, the parameters found in the *ini* file can also be changed via the web configuration tool for the product. For these parameters, inclusion in the *ini* file is a matter of convenience and enables the user to set up the Nortel MG 3200 in a shorter time since it is not necessary to configure these parameters through the web interface tool each time the system is loaded. Some of the parameters in the *ini* file are not configurable through any other means than the *ini* file. These parameters typically determine functionality at a low level and are not often, if ever, changed for the Nortel application.

Other parameters that need to be set, tend to be location-specific parameters, such as network settings, trunk configurations, and MGC to GW settings that must be matched for the two to inter-work properly. These parameters can only be set with specific site knowledge and are set through the web interface configuration tool.

This document assumes knowledge of the BootP/TFTP loading process for the MG 3200, familiarity with the concepts and settings for the protocols used in the Nortel solution, and a general knowledge of the Nortel MG 3200 Media Gateway and its web interface configuration tool. It is recommended that the user read and understand the MG 3200 User's Manual, document # LTRT-72704.

1.3   Overview

The following topics are discussed in this document:

- Installation and Upgrades

- Locality specific parameters

- Setting up Trunk configurations

- Configuring TDM Clock Source

- SS7 Backhaul (M2UA/M2TN)

- IPSec Configuration

- CAS Trunks

- Gateways behind a NAT

- T.38 & Bypass Fax Support

- Default *ini* file parameters

2 MG 3200 Installation and Configuration

The default initialization (*ini*) file contains parameters necessary for the inter-working of the Nortel MG 3200 with the Nortel solution. Descriptions of each parameter are included in the *ini* file. Any system parameter not included in the file assumes the default setting for the *cmp* file loaded on the system. The Nortel MG 3200 SN09 installation CD contains the default *ini* file for the gateway in the SN09 Nortel solution.

As delivered from Nortel, the MG 3200 has in memory the latest load approved by Nortel at the time of assembly. Once at site, the box should be upgraded with the latest version of the software as well as the default *ini* file, tones file, and any site specific configurations that need to be made. There are two methods in which to load the software and accompanying files: either through the BootP/TFTP application or through http using the web interface provided on the gateway.

Refer to the MG 3200 User's Manual for information on using 3rd party BootP/TFTP applications.

Refer to Nortel documentation for configuring the BootP/TFTP server used for the particular solution in which this unit is being placed. The new load and *ini* file should be burned to flash.

2.1 Upgrading an Installation

This simple procedure can be used as long as the IP address and basic configuration will not be changed.

1. Prepare for the upgrade by placing the latest cmp file in a local directory of a laptop or PC with access to the web interface of the gateway (or use the installation CD if it has the correct version).

2. Backup the current configuration by pressing the GET_INI button on the Advanced Configuration->Configuration File tab of the gateway's web interface, saving the INI file to a local directory with a unique and meaningful filename.

3. If this is an in-service upgrade, take the appropriate action at the call server to disable all traffic to the MG 3200.

4. Follow the procedure for using the Software Upgrade Wizard in the User's Guide to download the *cmp* to the gateway. After the file loads, click *Next* and ensure that the "Retain current configuration" checkbox is checked. Reset the gateway at the end of the procedure.

5. Backup the new configuration by pressing the GET_INI button on the Advanced Configuration->Configuration File tab of the gateway's web interface, saving the INI file to a local directory with a unique and meaningful filename.

6. Review the settings in the Basic Configuration section below.

7. Take the appropriate action at the call server to enable all traffic to the MG 3200.

> **Note**: If the unit is loaded with a software load of SN07 or earlier, it can not be upgraded using the Software Upgrade Wizard. Follow the procedure for new installations. The SN07 load can be identified in the Status & Diagnostics->Versions tab with load identifiers beginning with 4.20.xxx.xxx.

2.2 Installing a New Installation with Bootp

Configure the BootP/TFTP server with the IP parameters and the latest *cmp* file and the default *ini* file for this release (see the MG 3200 Installation Method for more information about installing

the BootP/TFTP application). Append the suffix " –fb" to flash burn the configuration so that in the future, the gateway will retain the load and configuration (see the User's Guide for more information about the flash burn extension to the BootP).

1. Configure the BootP/TFTP server with the latest *cmp* file and the default *ini* file for this release. In most cases, the *cmp* file and the default *ini* file can be found on the installation CD shipped with the gateway. Take the appropriate action to confirm the validity of the files on the CD (that is check for changes specified in the bulletins available through other distribution means).

2. Perform a hard reset on the MG 3200. A BootP request is sent to the BootP server. The MG 3200 gets its network configuration from the BootP server and then requests the *cmp* and *ini* files from the TFTP server plus any additional files listed in the *ini* file.

3. After the gateway resets, access the web interface to check that the MG 3200 successfully loaded the default *ini* file and other parameters.

4. Use the web interface to configure the MG 3200 for its role in the network. Refer to the instructions in the following sections in order to quickly configure the MG 3200 through the web interface.

> **Note**: If you are configuring the gateway for SS7 backhaul (M2UA/M2TN), you should follow the instructions in the section titled SS7 Backhaul (M2UA/M2TN).

2.3   Basic Configuration

1.   Navigate to the Protocol Management → Protocol Selection tab. It should
look similar to the following in **Figure 2-1** below:

Figure 2-1: Protocol Selection
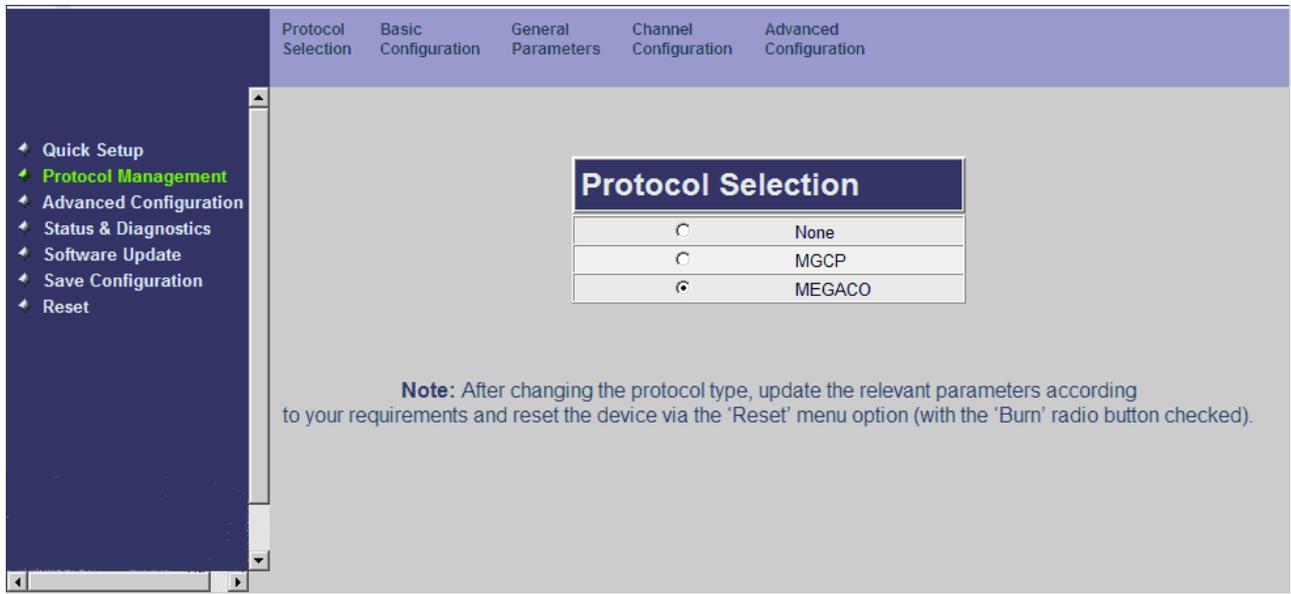
2. Navigate to the Advanced Configuration → Basic Configuration tab. This window should look as shown in Figure 2-2: Basic Protocol Configuration below:

Figure 2-2: Basic Protocol Configuration

3. Navigate to the Advanced Configuration → Channel Settings->Voice Settings tab. Ensure that the DTMF Transport Type is set to "Transparent DTMF" as shown in Figure 2-3 below.

Figure 2-3: Voice Settings
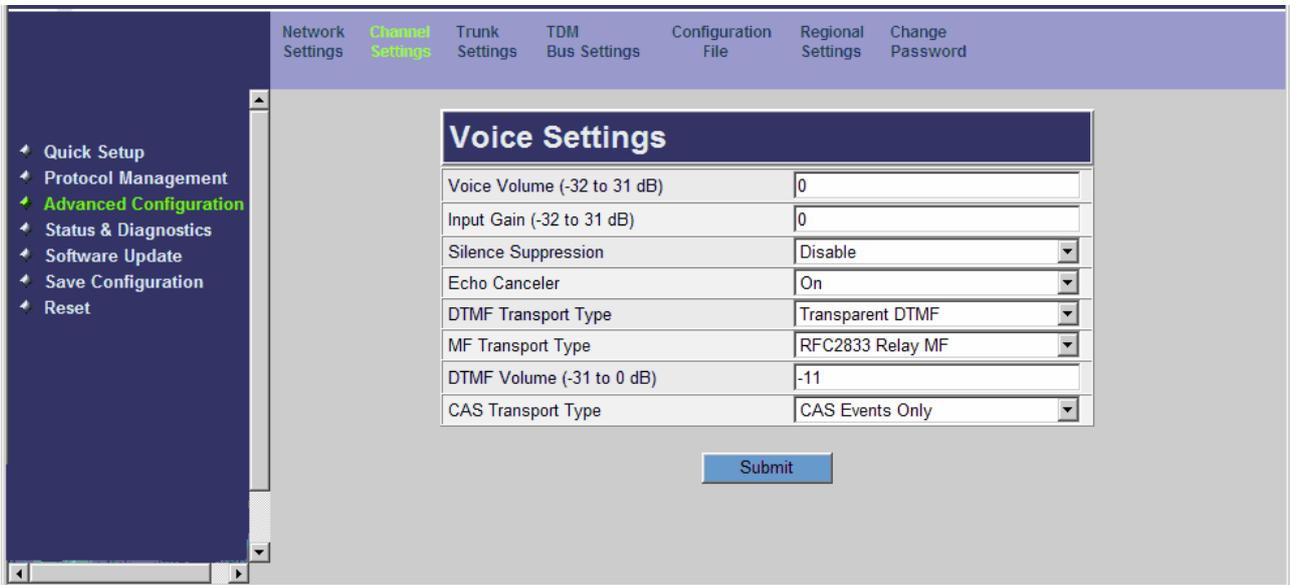
4. Navigate to the Advanced Configuration → TDM Settings tab. The parameters should be set as shown below. Specifically, the following parameters were set by the provided default *ini* file: TDM Bus Clock Source (Network), TDM Bus PSTN Auto Clock (Enable), and TDM Bus Type (Framers

> **Note**: PCM Law Select in the example is set up for PCM companding law of type µ-law (default) for input and output. This must be matched to the same type of companding being used on the remote end of the TDM trunks (µ-law or A-law).

Figure 2-4: TDM Bus Settings

Reader's Notes

Reader's Notes

3   Locality-Specific Parameters

Locality-Specific parameters are parameters that are specific to a particular MG 3200 in the network. These parameters include any IP addresses for other nodes that the MG 3200 comes in contact with or settings that are specific to the logical MG 3200 in its function within the system. These parameters also include trunk settings which are discussed in the next section.

This section guides the user through data filling the locality-specific parameters on the MG 3200.

1. Access the MG 3200 through the web interface. Navigate to the Protocol Management → Basic Configuration tab. Press the Provisioned Call Agents Button.

2. In the first Call Agent IP field, enter in the address of the MGC (GWC) to which this GW should be communicating.

3. Define the MEGACO physical terminations to correspond to the values set within the MGC (GWC) to allow for proper inter-working between the Nortel GWC and the Nortel MG 3200. At the top of the Basic Configuration screen, set the Physical Name Pattern. For example, where the representation needs to be DS1/01/1 through DS1/08/24, set the parameter using wildcards (*) as DS1/0*/*. Alternatively, where the representation needs to be E1/01/1 through E1/08/31, the value would be set to E1/0*/1. There are any numbers of other variations and the range defined by the wildcard depends in part on the specific product type and configuration.

   For backwards compatibility, the old way of defining the physical terminations can still be used from the INI file:

   > Gateway Name = "DS1" (this would be the trunk type on the GWC),
   > Trunk Name = "/0" (this would be the span name on the GWC),
   > Endpoint Name = "/"
   > Note – a parameter "MEGACOTRUNKIDOFFSET" was set to a value of "1" in the default *ini* file to align the gateway's internal mapping (begins with 0) with the Nortel architecture (begins with 1).

4. Select the Submit button to save changes to the Basic Configuration window, which should look similar to Figure 3-1: Protocol Basic Configuration on page 18:

Figure 3-1: Protocol Basic Configuration

5. Select the Advanced Configuration → Network Settings->Application Settings tab.

6. Enter the Syslog Server IP address and enable the Syslog by setting "Enable Syslog" to 'Enable'.

7. Select **Submit** to apply the values. The Network Settings window should look as Figure 3-2: Network Settings below:

Figure 3-2: Network Settings

8. At this point, the MG 3200 is ready to have its TDM configuration set up (described in the next section). If this is to be the stopping point for configuration of this box, the user can reset the box and pull the board configuration file back from the MG 3200 as a backup that can be loaded in later. Continue with the next steps in this section to do that.

9. Select the Reset button, followed by the Restart button to reset the box (Select burn to save the configuration).

10. After the box resets, it comes up with all the default settings from the default *ini* file, plus the additional settings that were configured through the GUI. (You may want to verify).

11. Go to Advanced Configuration … Configuration File tab as shown in Figure 3-3: Configuration File below.

Figure 3-3: Configuration File
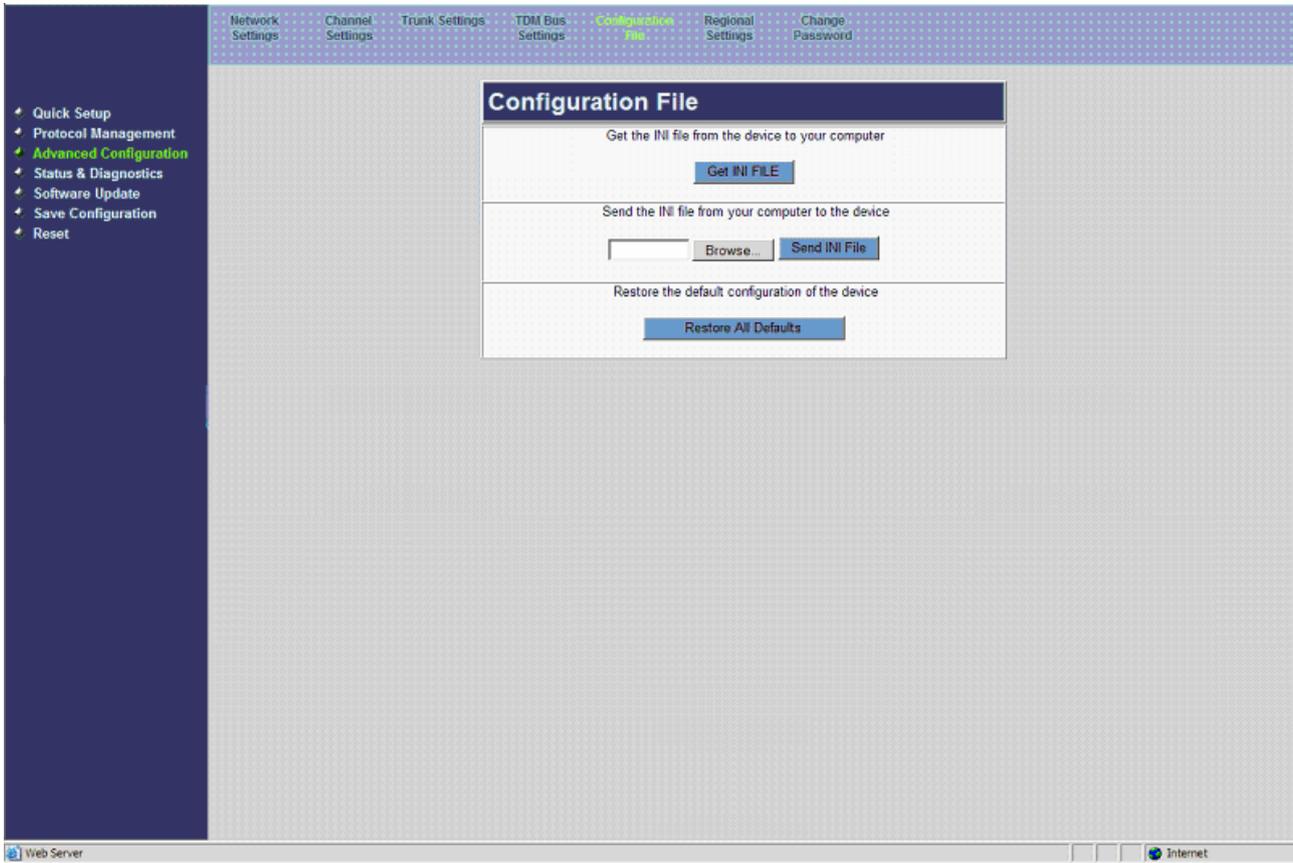
12. Select the "Get *ini* file" button to pull the board configuration back to your desktop. This file can be saved and loaded back into the box at a later time to bring the unit back to the configuration reached in this section. You may want to name the file appropriately so as to know its content.

4   Setting up Trunk Configurations

This section provides some guidelines and instruction for provisioning the trunk configurations that have been selected for use on the MG 3200 by Nortel for this release. These include the following protocols on the MG 3200:

■   T1_IUA – relays ISDN signaling through SIGTRAN IUA and SCTP protocols

■   E1_IUA – relays ISDN signaling through SIGTRAN IUA and SCTP protocols

■   T1_Transparent – channels 1-24 mapped to DSP channels

■   E1_Transparent_30 - channels 1-31, except 16 mapped to DSP channels

■   E1_Transparent_31 – channels 1-31 mapped to DSP channels

■   CAS Protocols

4.1   ISDN Relay (IUA: ISDN User Adaptation)

The MG 3200 supports the relay of ISDN signaling messages using SIGTRAN IUA and SCTP protocols. A signaling message coming into the MG 3200 from an ISDN connection goes through the data link layer and the Q.931 protocol data unit is relayed to the MGC (GWC) using IUA over SCTP over IP.

The setup for ISDN Relay involves selecting E1_IUA or T1_IUA protocol types, network or user termination, and data filling the IUA interface identifier with the correct d-channel mapping. IUA trunks are configured per D-channel. Configuration is done on the Advanced Configuration →Trunk Settings tab shown in Figure 4-1: Trunk Settings on page 22.

Here are a few notes regarding the use of the IUA protocols.

- E1 and T1 protocols can not be configured on the same logical gateway.

- The IUA Interface ID is unique per logical gateway.

- If SS7 backhaul is used with IUA, the SIGTRAN group for the IUA uses group 1. Therefore, GROUP_1 can not be used for SS7.

- IUA and DUA can not be defined on the same logical gateway.

- Q.931 messaging only passes through the MG 3200 when set up to transport ISDN messages over IUA. The messages are not manipulated by the MG 3200.

Figure 4-1: Trunk Settings
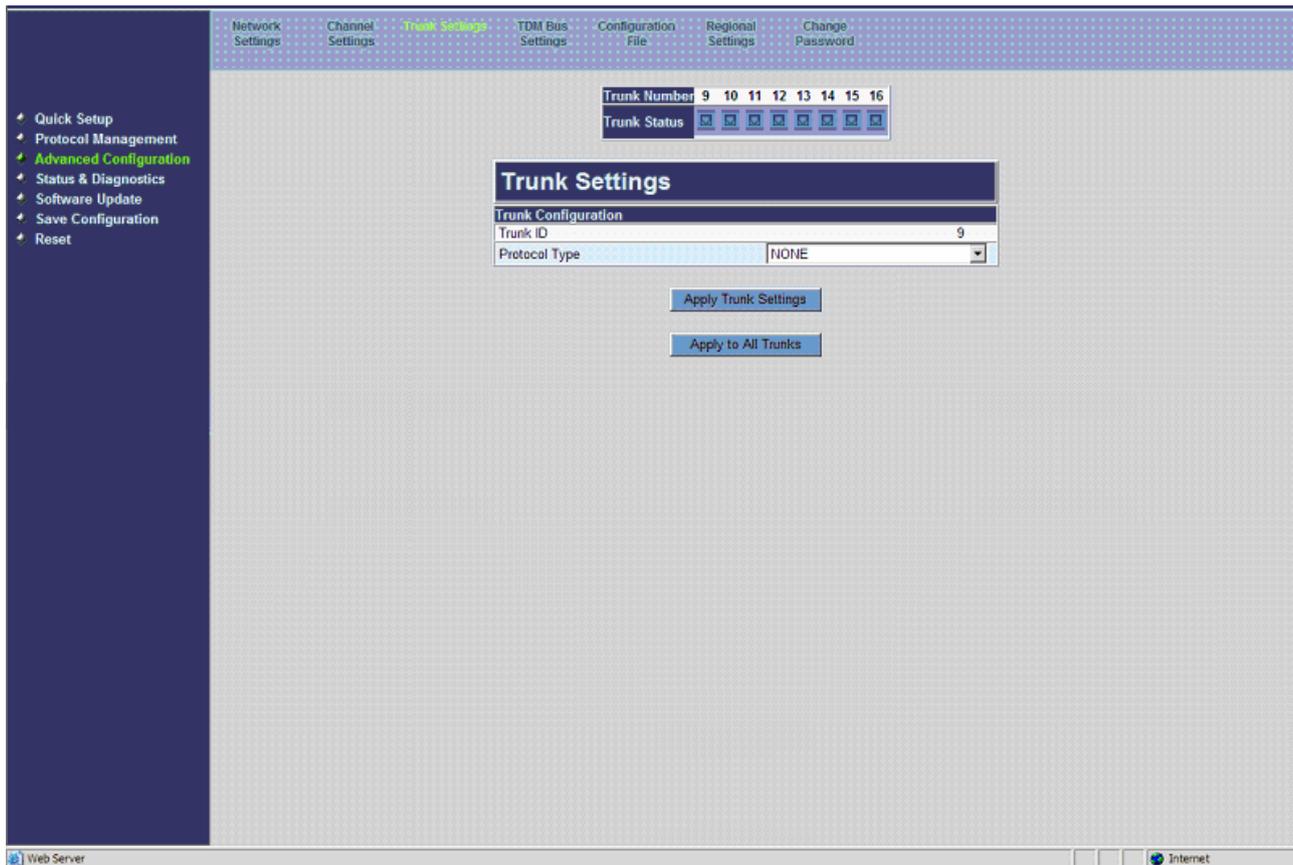
4.1.1 Example 4.1.1: Configuring ISDN Relay for a Single T1

Example 4.1.1 includes a Single T1 trunk, User-side.

➢ **To configure ISDN Relay, take the next 10 steps:**

1. Access the MG 3200 through the Web server utility.

2. Go to the Advanced Configuration … Trunk Settings page.

3. Acknowledge notice to restart board after changing trunk configuration.

4. For TrunkID 1, select T1_IUA for protocol type.

5. Set the ISDN Termination Side accordingly (user/network). This should be the compliment of the setting in the Nortel equipment for the trunk.

6. Verify that "Outgoing Calls Behavior" = 0x4000. (This was set in the default *ini* file).

7. Set the "IUA Interface Id" = X, where X is the logical mapping for IUA interface to the D-channel between the MGC and the MG 3200. In this example, we are using 24. The window should appear as shown in Figure 4-2: Trunk Settings below:

Note: The IUA Interface ID is the logical mapping assigned to the d-channel on the GWC and is commonly referred to as the terminal identifier (tid) in CS2K

Figure 4-2: Trunk Settings
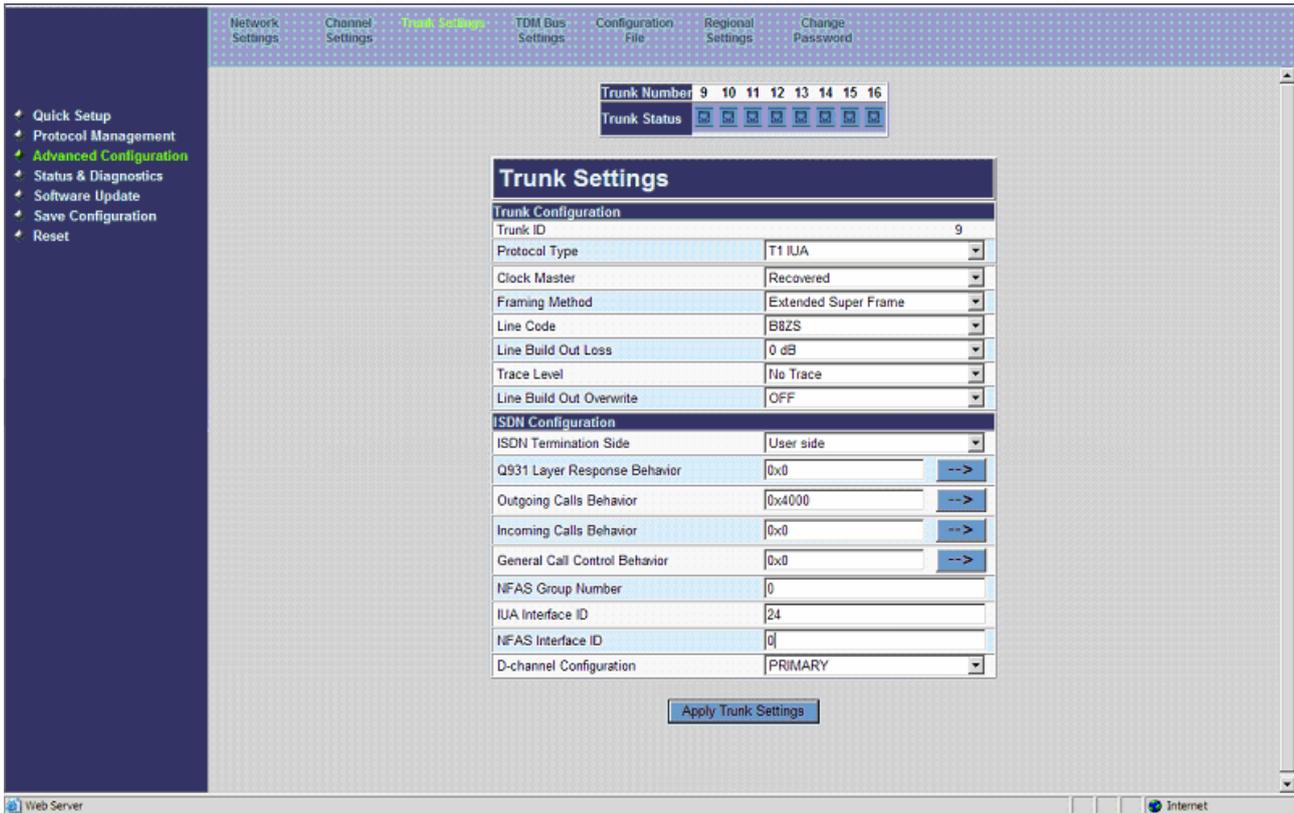
8. Apply the Trunk Settings and save the configuration by selecting 'Save Configuration'.

9. Once Trunk Settings are applied, the board must be restarted using the reset button (choosing burn to save your settings). Thereafter, data fill changes to IUA trunks after the IUA protocol has been started for a particular trunk require that the trunk be stopped, the configuration changed, saved, and the board restarted.

10. Once the board has been restarted the IUA Trunk Status changes to green if it has been configured properly. Check for green icons in the "Trunk & Channel Status" tab of the Status and Diagnostic page as shown in Figure 4-3: Trunk & Channel Status below:

Figure 4-3: Trunk & Channel Status
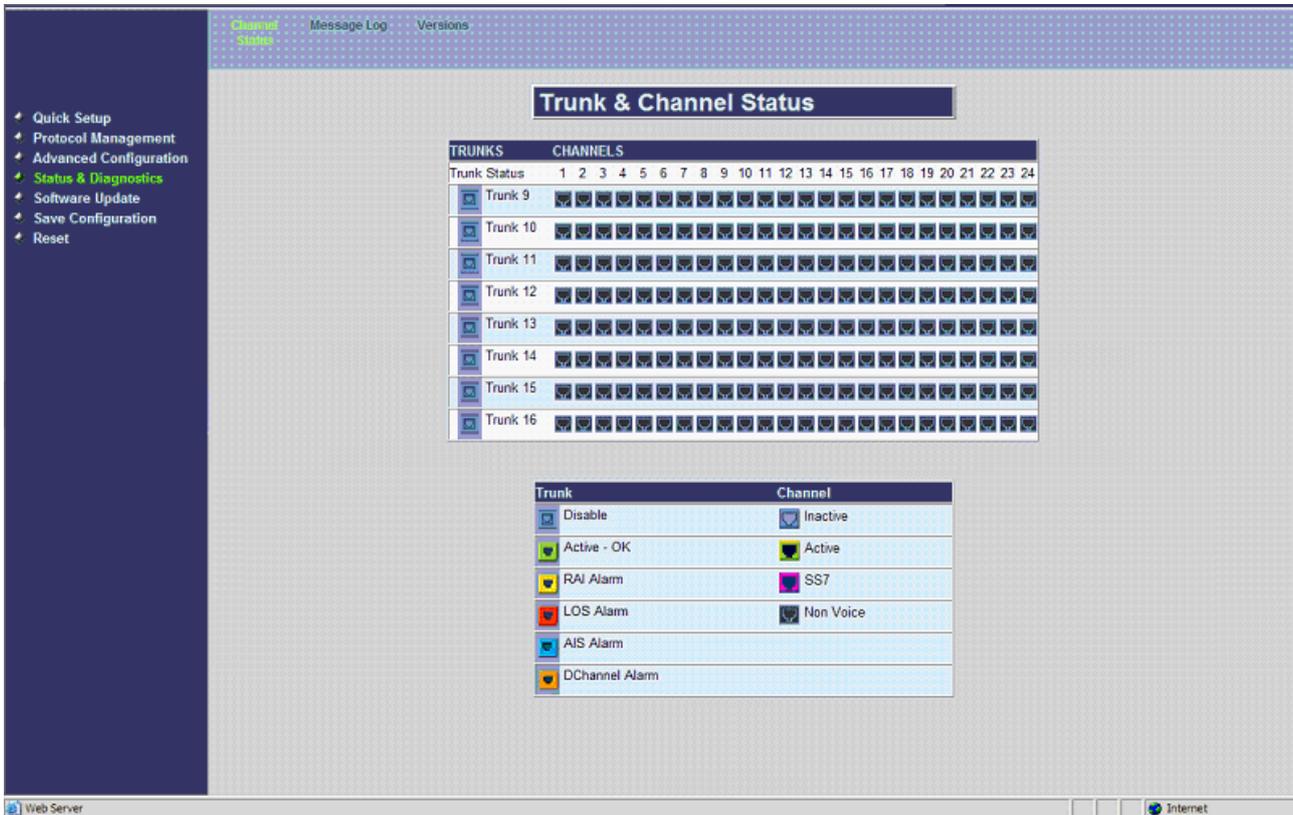
For this configuration, if the *ini* file were retrieved from the board through the Advanced Configuration → Configuration File → Get *ini* File option, the portion of the file relevant to the trunk configuration would resemble the following:

ProtocolType_0 =   28

TerminationSide =   0

IUAInterfaceID_0 =   24

Note that the default for TerminationSide for all trunks is 0. See the next example where when one becomes different than the rest, the param is broken out to TerminationSide_0, TerminationSide_1, etc

4.1.2   Example 4.1.2: Configuring ISDN Relay for Multiple Trunks

Example 4.1.2 includes 2 T1 trunks, 1 User-side, 1 Network-side

This configuration is the same as the example 1, except 2 T1_IUA trunks would be configured (each with their own IUA interface ID).

For this configuration, if the *ini* file was retrieved from the board through the Advanced Configuration → Configuration File → Get *ini* File option, the portion of the file relevant to the trunk configuration would resemble the following:

ProtocolType_0   = 28

ProtocolType_1   = 28

TerminationSide   = 0

TerminationSide   = 1

IUAInterfaceID_0   = 24

IUAInterfaceID_1   = 48

4.1.3   Example 4.1.3: Configuring ISDN relay for NFAS trunks with Backup D-channel

Example 4.1.3 includes 2 T1 trunks, User-side and a Backup D-channel

This example is the same as Example 4.1.2, except the designated backup span should also be made into a T1_IUA trunk. Below is a screen shot of a second T1_IUA trunk set up to handle the signaling for a backup D-channel. Note that this is the same configuration used for the primary channel except for the IUA interface ID. The screens of the GUI are used for many protocols. The IUA protocols do not terminate on the MG 3200 board, and so, not all fields are used. (Note that the "D-channel Configuration" field has no meaning in this context).

Figure 4-4: T1_IUA trunk for a Backup D-channel
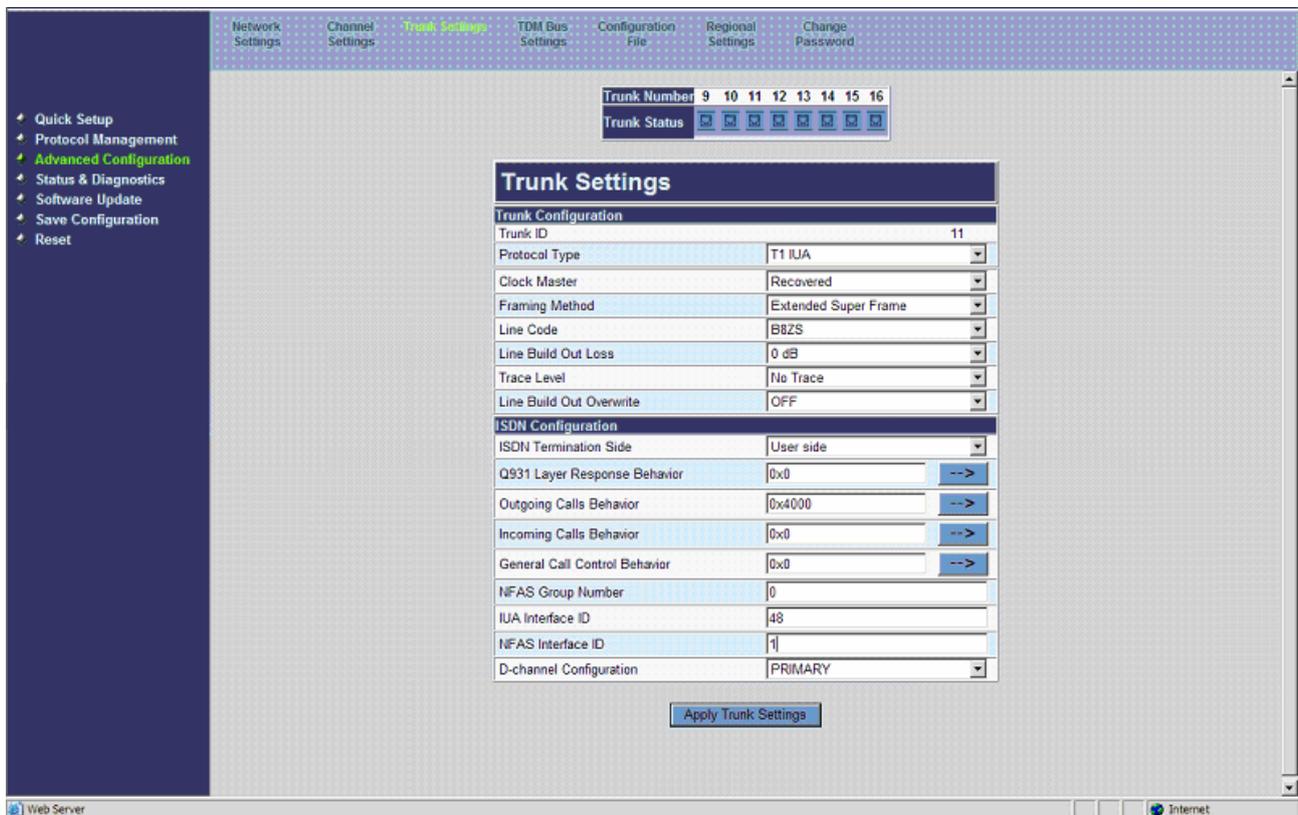
For this configuration, if the *ini* file was retrieved from the board through the Advanced Configuration → Configuration File → Get *ini* file option, the portion of the file relevant to the trunk configuration would resemble the following:

ProtocolType_0   = 28

ProtocolType_1   = 28

TerminationSide   = 0

TerminationSide   = 0

IUAInterfaceID_0   = 24

IUAInterfaceID_1   = 48

> **Note**: The MG 3200 is the Signaling Gateway and the GWC is the MGC. The MG 3200 is handling layer 2 (Q.921) and not layer 3 (Q.931). The MG 3200 passes the Q.931 through SIGTRAN (IUA) to the MGC. NFAS intelligence is in the Q.931 layer, so the MG 3200 is really unaware of whether the signaling is over a primary or back-up channel. The MG 3200 just knows that it is receiving messaging in the IUA pipe.

4.2   DPNSS Relay (DUA: DPNSS User Adaptation)

DUA is based on the draft-ietf-sigtran-dua-08 published by the IETF. Refer to https://datatracker.ietf.org/public/idindex.cgi?command=id_detail&id=7506. It is implemented with BTNR 188 DPNSS Layer 2 (an early ISDN protocol in the U.K.; British Telecom Network Requirements). A signaling message entering the device from the DPNSSL2 connection goes through the Data Link Layer. A DPNSSL2 PDU is then relayed to the Media Gateway Controller using DUA over SCTP over IP. The Media Gateway Controller supports SCTP and DUA layers on its side and then completes the upper signaling layers of Figure 4-5.

4.2.1   DPNSSL2 Protocol

1. The link layer can use 30 real channels; an additional 30 virtual channels can be used for services.

2. The link layer uses compelled signaling with Layer 2 on the far end.

4.2.2   DUA Signaling Messages

Figure 4-5: DPNSS Signaling Messages
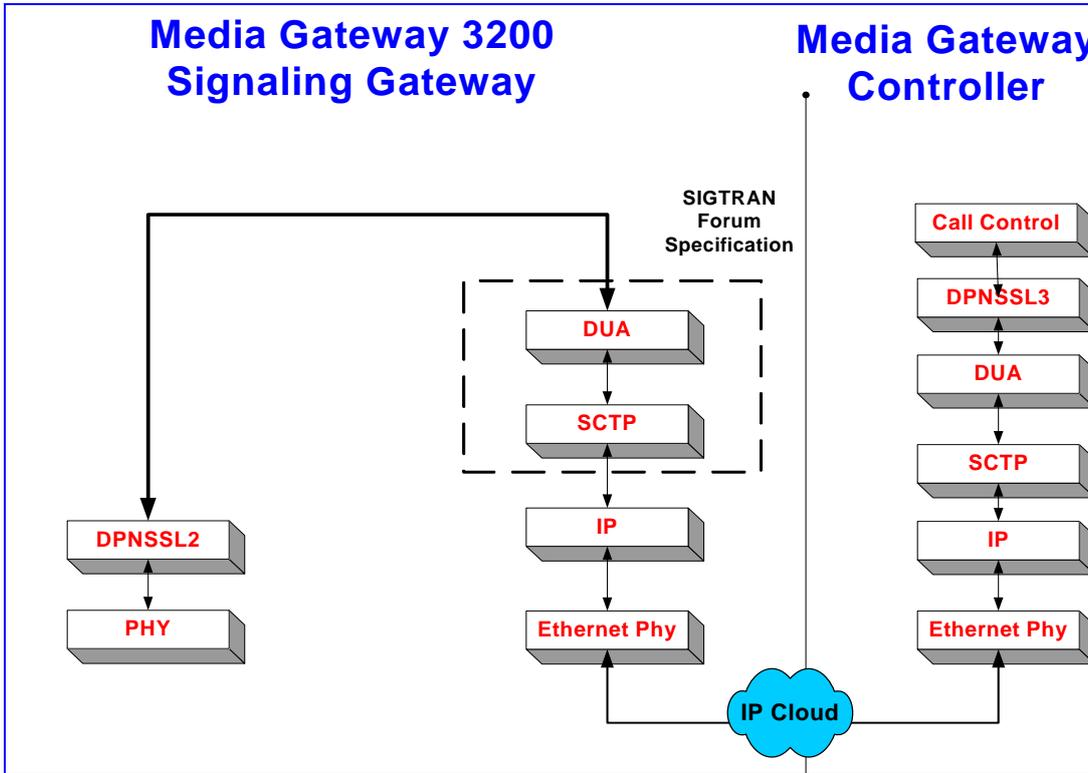
4.2.3   Configuring SIGTRAN DUA

Here are a few notes regarding the use of the DUA protocols.

- IUA and DUA can not be defined on the same logical gateway.

- In SN09 release, there is a limitation of only 4 E1 DUA spans per TPM is supported.

4.2.3.1   Configuring via the INI file

Use the *ini* file parameter values below to configure a DUA connection.

Table 4-1: SIGTRAN DUA Configuration Parameters

ini File Field Name (X is the Trunk)	Valid Range	Description
IUAINTERFACEID_X	Unsigned Integer	Used for the DUA Interface ID. (Note: Must be unique and match the value provisioned for the corresponding carrier on the Call Server Element Manager).
ProtocolType_X	acPROTOCOL_TYPE_E1_DUA = 37	DUA PSTN protocol type causes the DUA layer to be above the DPNSSL2 layer.
DPNSSBehaviour	Ulong	DPNSS behavior bit field for options implementation.
DPNSSNumRealChannels	Char - Valid range 1-30	Number of real B-channels used for voice. Default = 30.

ini File Field Name (X is the Trunk)	Valid Range	Description
DPNSSNumVirtualChannels	Char - Valid range 0-30	Number of virtual B-channels used for services. Default = 30.
DisconnectBehavior	**1** – No action (default: do nothing) **2** – DisableTrunks and apply AIS alarm to TDM side of the gateway for all trunks. **3** – Reserved for future use	– When the parameter is absent from the ini file, it defaults to 'No Action' meaning that the trunk (carrier) stays in service on loss of H.248 heartbeat at the TDM side of the gateway. – When the parameter is set to '2', loss of H.248 connectivity (for events such as Ethernet cable disconnections, or loss of H.248 control due to peripheral failures ,etc.), is passed on to the TDM side by the AC gateways i.e. connectivity loss is signaled to the connected PBXs by means of layer 1 AIS alarm to prevent any further traffic to a gateway that cannot handle any calls. Upon reconnect, H.248 will generate service change for ALL the trunks, the trunks with alarm (i.e. not synchronized) will be generated with the service change parameter "FORCED", the rest will be generated with the service change parameter "RESTART". Important Note: it is the user responsibility as a pre-condition to activate KeepAlive mechanism i.e. implementing Inactivity Timer Package event.

4.2.3.1.1 DPNSSBehavior Bits Values

DPNSS_BEHAV_STOP_SABMR_AFTER_NL_AND_NT1 bit: (bit #0, bitmask 0x0001)

> when 1: DPNSS stops repeating SABMR after NL and NT1 limits are exceeded
> when 0: DPNSS continues repeating SABMR after NL and NT1 limits are exceeded
> Default is 0 (continue repeating SABMR).

DPNSS_BEHAV_FULL_STARTUP_SUCCESS bit: (bit #1, bitmask 0x0002)

> when 1: the startup procedure is considered a SUCCESS only when ALL DLCs succeed to reset
> when 0: the startup procedure is considered a SUCCESS as soon as 1 DLC succeeds to reset
> Default is 0: (only partial reset is considered a success).

DPNSS_BEHAV_DLC_OOS_AFTER_NL_AND_NT1 bit: (bit #2, bitmask 0x0004)

> (Note: The current implementation is 'the DLC is declared OOS to the MGC after NL and NT1 limits are exceeded' regardless of bit setting)

DPNSS_BEHAV_DLC_OOS_WHEN_L3_Q_FULL bit: (bit #3, bitmask 0x0008)

(Note: The current implementation is 'the DLC is declared OOS to the MGC when the L3 queue limit is exceeded' regardless of bit setting).

4.2.3.2   Configuring via the Web Interface

Login to the MG 3200 web server and select "Advanced Configuration" in the left hand pane. Then select "Trunk Settings" from the top menu. Select the trunk to be configured by clicking on the appropriate trunk status icon. Select "E1 DUA" as the protocol type and fill in the remaining fields according to the desired characteristics. See Figure 4-6 Trunk Settings Configuration Page

You will see a screen similar to this:

Figure 4-6 Trunk Settings Configuration Page
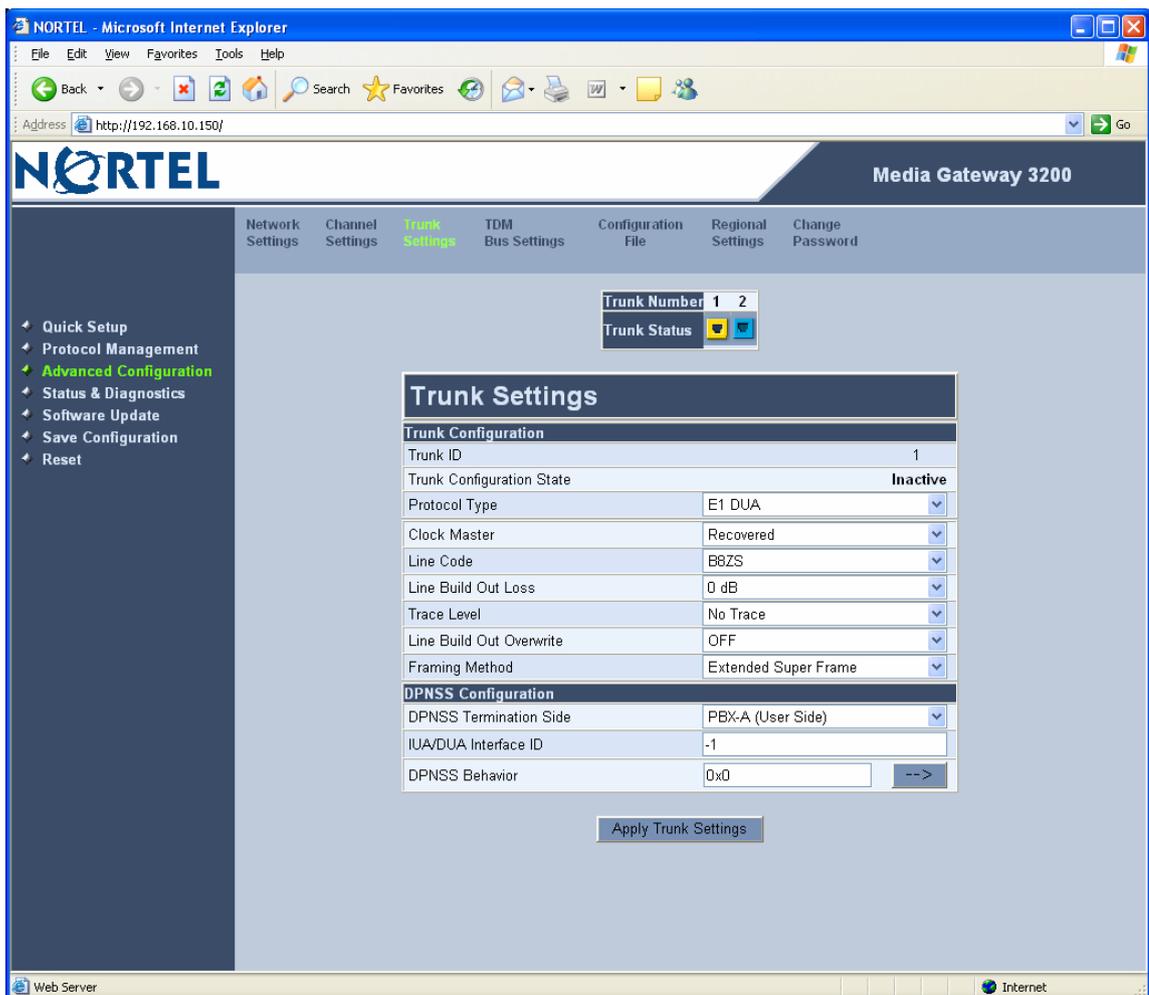
Guidelines for provisioning DUA configuration are provided in the following sections:

1. **9.2 Sample Default *ini* File version SN09 (DPNSS)** on page 69

2. **9.3 Sample Default ini File version SN09 (CPE DPNSS)** on page 73

4.3   Transparent Protocols

The MG 3200 supports bearer path termination using the Transparent protocols. For ISDN, these protocols would be used for spans that do not host the d-channel for a trunk group, such as the b-channel spans for an NFAS trunk group where the Q.931 signalling is being passed over the IUA on another span. Refer to example 4.3.1. Additionally, the Transparent protocols can be used for support of SS7 bearer path terminations. In this case, the protocol type for the spans would be set to the appropriate Transparent protocol T1 or E1. For E1_Transparent, there are options for reclaiming timeslot 16. Nortel typically reclaims this timeslot for use, so the setting would be E1_Transparent_31. If E1_Transparent_30 is used, attempts to establish a bearer path on timeslot 16 are rejected.

Here are a few notes regarding the use of the Transparent protocols:

- If using E1_Transparent_31, it is the only protocol type that can be used on that logical gateway.

- The number of DSP resources per logical GW (8 span) is 240. If using Transparent_31, the first 240 channels requesting a DSP resource have those resources allocated. Attempts to open bearer channels beyond that, is denied.

- The E1_Transparent protocols can not be configured on the same logical gateway as either T1_Transparent or T1_IUA protocols.

- The T1_Transparent protocol can not be configured on the same logical gateway as either E1 Transparent or E1_IUA protocols.

4.3.1   Example 4.3.1: Configuring Transparent Protocol for NFAS Trunks

Example 4.3.1 includes 4 T1 trunks, Single D-channel, User-side

This configuration is similar to Example 4.1.1 in that 1 T1_IUA trunk is configured to handle the D-channel, but along with that, 3 T1_Transparent trunks are configured for the 3 remaining B-channel only trunks. Below is a screen shot of a T1_Transparent Trunk.

Figure 4-7: Transparent Trunk
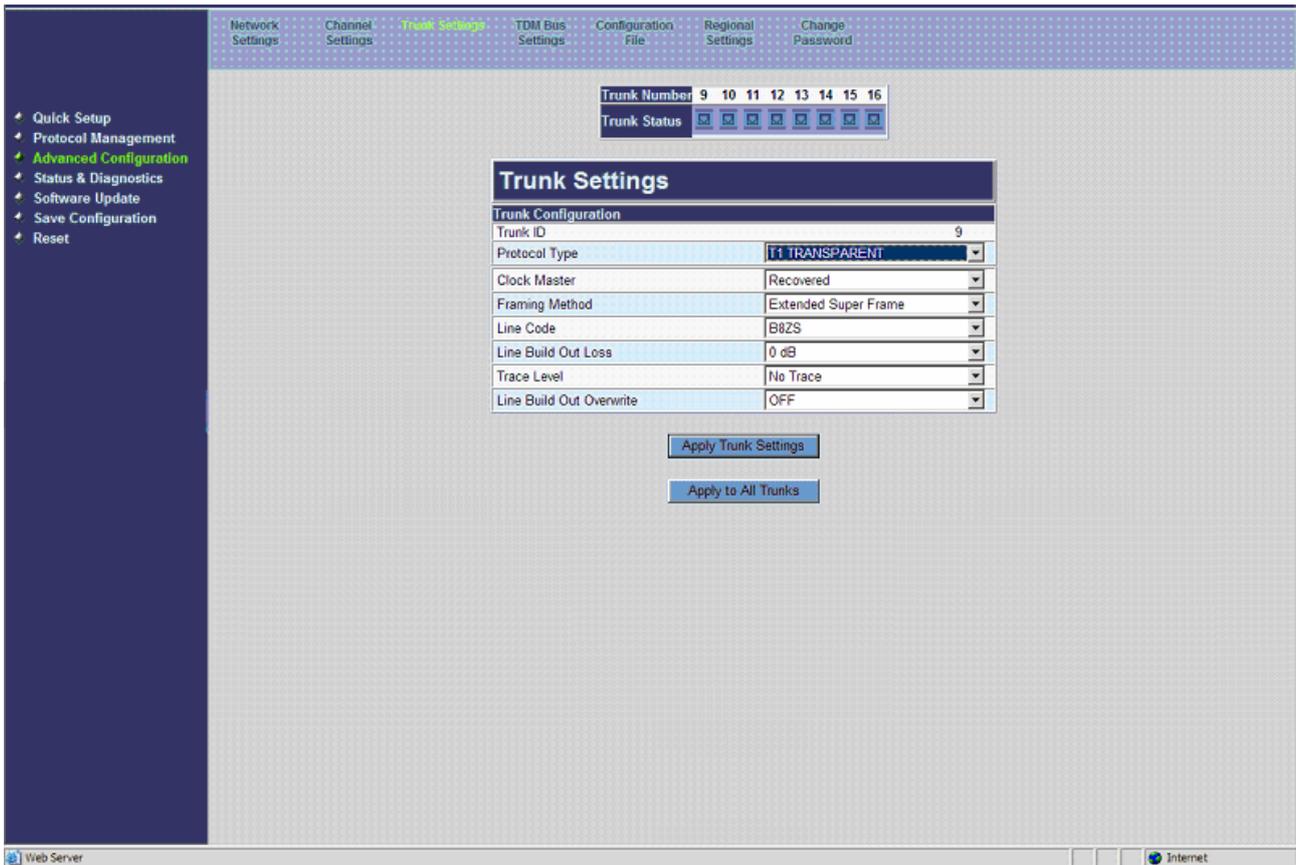
For this configuration, if the *ini* file were retrieved from the board through the Advanced Configuration → Configuration File → Get *ini* File option, the portion of the file relevant to the trunk configuration would resemble the following:

ProtocolType_0   = 28

ProtocolType_1   = 4

ProtocolType_2   = 4

ProtocolType_3   = 4

TerminationSide_0   = 0

IUAInterfaceID_0   = 24

Note: TerminationSide_1, TerminationSide_2, TerminationSide_3, IUAInterfaceID_1, IUAInterfaceID_2, and IUAInterfaceID_3 values are not listed here because when the ProtocolType is set to 4, those values are irrelevant.

4.3.2 Example 4.3.2: Configuring Transparent Protocol for ISUP Trunks

Example 4.3.2 includes 4 ISUP trunks

For this configuration, if the *ini* file were retrieved from the board through the Advanced Configuration → Configuration File → Get *ini* File option, the portion of the file relevant to the trunk configuration would resemble the following:

ProtocolType_0 = 4
ProtocolType_1 = 4
ProtocolType_2 = 4
ProtocolType_3 = 4

Note: TerminationSide_0, TerminationSide_1, TerminationSide_2, TerminationSide_3, IUAInterfaceID_0, IUAInterfaceID_1, IUAInterfaceID_2, and IUAInterfaceID_3 values are not listed here because when the ProtocolType is set to Transparent (4), those values are irrelevant.

4.4 CAS Trunks

The MG 3200 supports up to 8 different CAS files containing specific CAS protocol definitions. These files are provided by Nortel to support various types of CAS signaling.

Initial loading the CAS files by TFTP/BootP is covered in the MG 3200 User's Manual and the MG 3200 H.248 & SIP Fast Track Installation Guide under the heading "Downloading Auxiliary Files via TFTP During the BoardStartup".

CAS files should always be updated during the upgrade procedure using the Software Upgrade Wizard. This is described in the User's Guide and also in the MG 3200 H.248 & SIP Fast Track Installation Guide. There are also several procedures which describe how to maintain the gateway by updating the CAS file(s).

Note: For CAS-R2 in MEGACO, currently only E1-MFCR2 (Protocol 7) protocol is supported (there is no T1 or R1).

4.4.1 CAS INI File Examples

The following list contains the ini file parameters that control the CAS files that can be downloaded to the MG 3200:

- "ProtocolType" – Select one of the CAS trunk protocols from the list: T1_CAS = 2, T1_RAW_CAS = 3, E1_MFCR2 = 7, E1_CAS_R2 = 8, E1_RAW_CAS = 9.
- "CASFileName_0"…"CASFileName_7" (or "CASFileName") - The names (and path names) of the files containing the CAS protocol configuration. It is possible to use 1 to 8 files. The "CASFileName" name is still supported and can be used instead of the enumerated names when using only one CAS protocol file.
- "CASTablesNum" - Indicates how many CAS protocol configuration files are loaded. Its range is 1-8. It should match the number of "CASFileName_X" fields.

- "CASTableIndex_TrunkNum" (TrunkNum should be an integer) - This field is a CAS protocol file index. It indicates the CAS protocol file to use in a specific Trunk. The index value corresponds to the number in the field "CASFileName_X".

The following example shows how to configure trunks one and two with different CAS protocol files. Note that in the INI files trunks are counted using a zero based scheme so that CASTableIndex_0 refers to trunk 1 (or trunk 9 on the right-hand side virtual gateway):

```
[PSTN Params]


ProtocolType = 7
CASTableIndex_0 = 0
CASTableIndex_1 = 1
CASTablesNum = 2
CASFileName_0 = 'R2_Korea_ANI.dat'
CASFileName_1 = 'R2_Korea_CP_NoANI.dat'
CASFileName_2 = ''
CASFileName_3 = ''
CASFileName_4 = ''
CASFileName_5 = ''
CASFileName_6 = ''
CASFileName_7 = ''
```

Note: When only one CAS file is in use, the individual CASTableIndex_TrunkNum (CASFileName_X) parameters do not need to be used (they will default to 0).

Make sure to copy the CAS files to be downloaded to the default directory where the TFTP application will access them before the hard reset. This is the same directory where the INI file is located.

4.4.2   CAS GUI Examples

The Advanced_Configuration->Trunk_Settings tab can be used to set up the trunks or just to confirm the settings downloaded using TFTP/BootP.

When configuring CAS for the first time, stop the trunk (if necessary) and change to the desired protocol type. Then select from the CAS table pull-down which will correspond to the filenames which are currently loaded. To select the next trunk, click on the trunk icon below the trunk number.
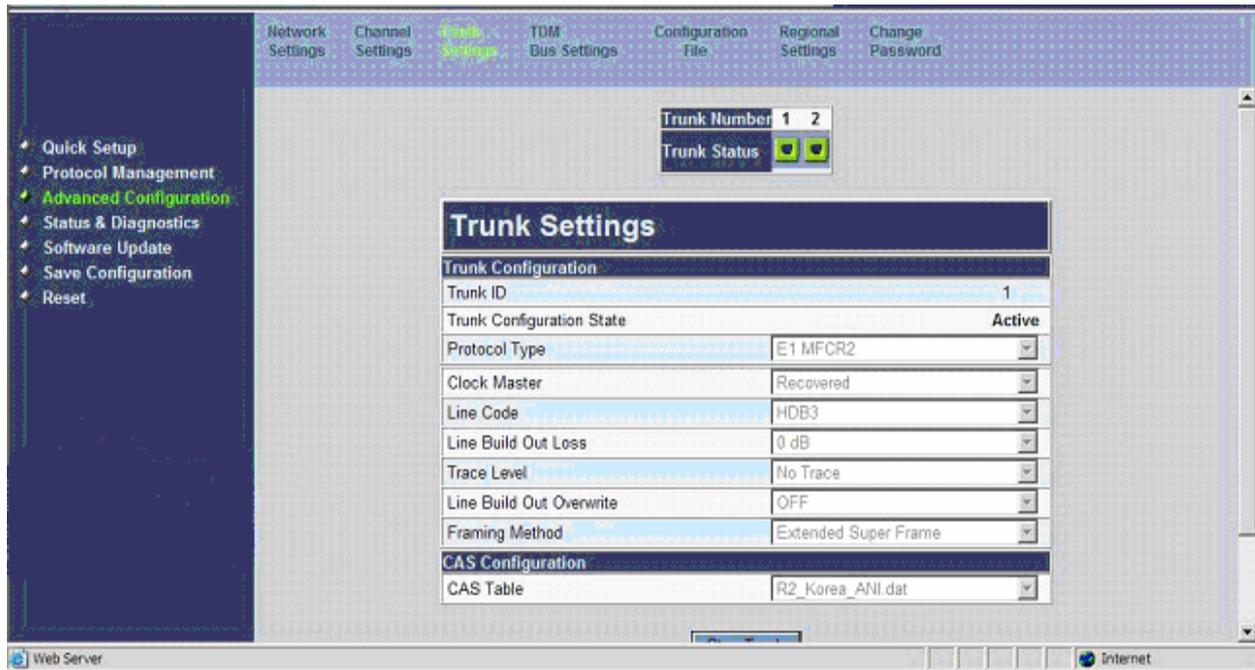
Figure 4-8 - Configuring CAS Trunks

The gateway must be reset (with flash memory burn) after changing the trunk settings.

During an upgrade, the Software Upgrade Wizard can be used to download one or more CAS files to the gateway's non-volatile memory.
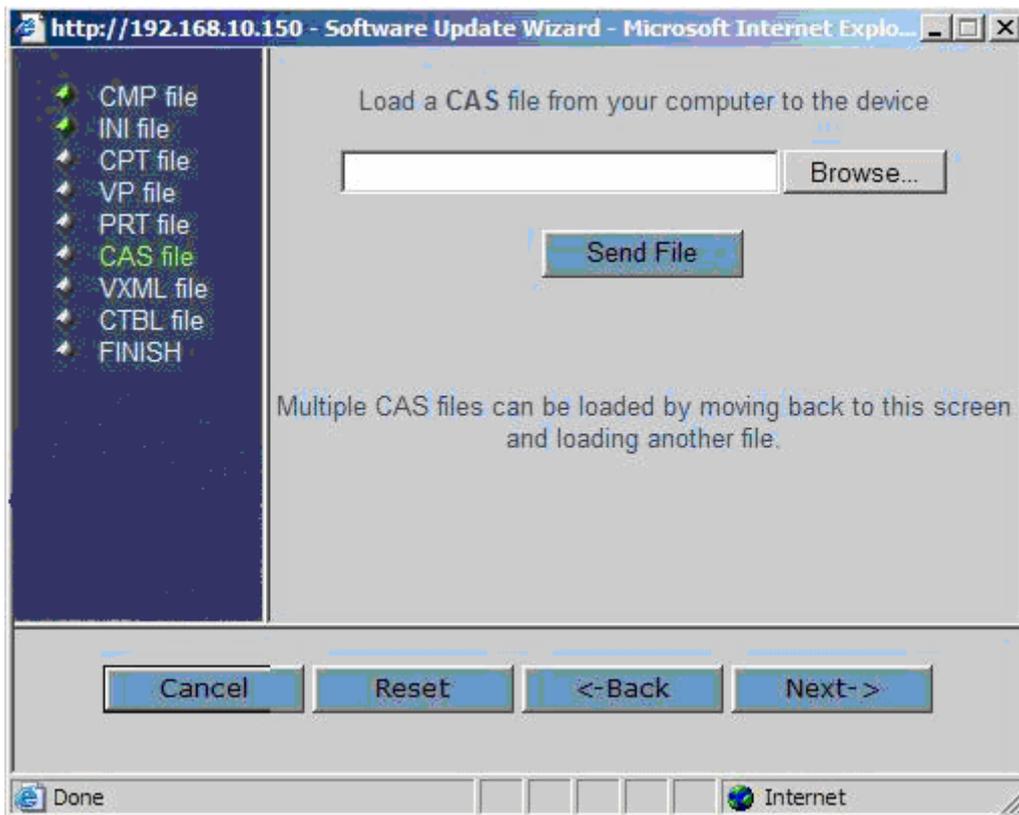
Figure 4-9 - Software Upgrade Wizard (CAS File)

Note that this is must be done each time since between releases changes are sometimes made to the CAS tables.

4.4.3   Lineside T1 CAS

When configuring for Lineside T1 CAS, add the following parameter to the INI file before loading it to the gateway:

```
TrunkingToAnalogFunctionalityProfile = 1
```

Then locate the FXS loopstart or FXS groundstart CAS files and follow the instructions for loading them as described in the previous sections. Other than the above setting, the rest of the settings can be done through the various GUI screens. Set the Protocol Type and the CAS Table Name to values shown in the following figure.

Figure 4-10 - Lineside T1 Trunk Sample Screen

The following example shows the Physical Name Pattern convention used with the Nortel SL-100 call agent. Verify this setting on the call agent and set it accordingly.
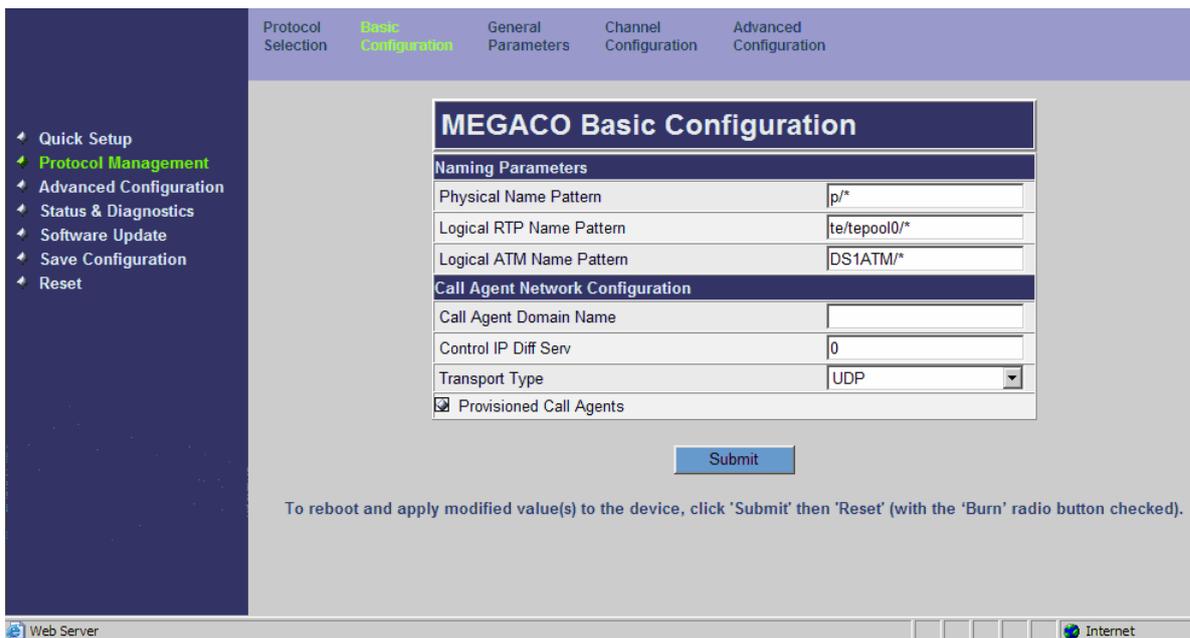
Figure 4-11 - Setting the Physical Name Pattern

A gateway reset (with burn radio button checked) is required after making the trunk setting changes.

The following sample INI file settings can be used as a reference:

```
TrunkingToAnalogFunctionalityProfile = 1

PhysTermNamePattern = 'p/*'

ProtocolType_0 = 2

CASTableIndex_0 = 0

CASTablesNum = 1
```

```
CASFileName_0 = 'GroundStartTable_FXS.dat'
```

Note: When only one CAS file is in use, the individual CASTableIndex_TrunkNum (CASFileName_X) parameters do not need to be used (they will default to 0).

The CAS file can also be `LoopStartTable_FXS.dat` depending on the application.

5   Clock Source and Fallback

The ability to set or derive a timing reference for the MG 3200 can be done from the PSTN interfaces. Clock is derived off of a predefined framer when properly set, or can be set to automatically synchronize the internal oscillator based on setting allowable PSTN interfaces to be used as a possible clock source.

The following parameters are used to control clock source and fallback on the MG 3200.

ClockMaster = 0

This means that the clock is recovered from the framer. A value of '1' would tell the unit to use the internal oscillator for the timing reference. Any framer one would wish to use as a potential clock source should have the value '0' set to it for its clockmaster definition (see below),

TDMBusPSTNAutoClockEnable = 1

This allows the TPM module to synchronize off of a different framer if the 'preferred' framer selected fails. It would then attempt to synchronize off of another framer that had the clockmaster_x value of '0'. If this is not set to 1, then the unit free runs if the timing reference is lost.

TDMBusClockSource = 4

This is stating that the clock should be taken from the PSTN network interface (framers). The default value is 0. If the default value is used then the TPM would take the timing reference from framer 0 only. The Nortel default *ini* file sets this value to 4.

TDMBusType = 2

This is stating that the bus type used is to interface the framers.

TDMBusLocalReference = 0

This is the preferred timing reference for the unit. It is telling the unit (based on the above setting) to take the incoming timing reference from span 0 and drive the internal oscillator and use it to drive the rest of the TPM module framers. Note that this setting uses 0 through 7 to reference the 8 trunks available on the virtual gateway, for example 0 will be span 1 (or 9 on the right-hand side).

Clock Reference Example

Following is an example of the *ini* file settings to configure the board to derive the clock source from a specific span and allow automatic fall back of the timing reference. The timing parameters would be as follows to reference the first PSTN driver and allow the last as a fall back if the first was to fail.

```
TDMBusClockSource   = 4

TDMBusType  = 2

TDMBusPSTNAutoClockEnable  = 1

ClockMaster_0      = 0

ClockMaster_1      = 1

ClockMaster_2      = 1

ClockMaster_3      = 1

ClockMaster_4      = 1

ClockMaster_5      = 1

ClockMaster_6      = 1
```

```
ClockMaster_7        = 0

TDMBusLocalReference        = 0
```
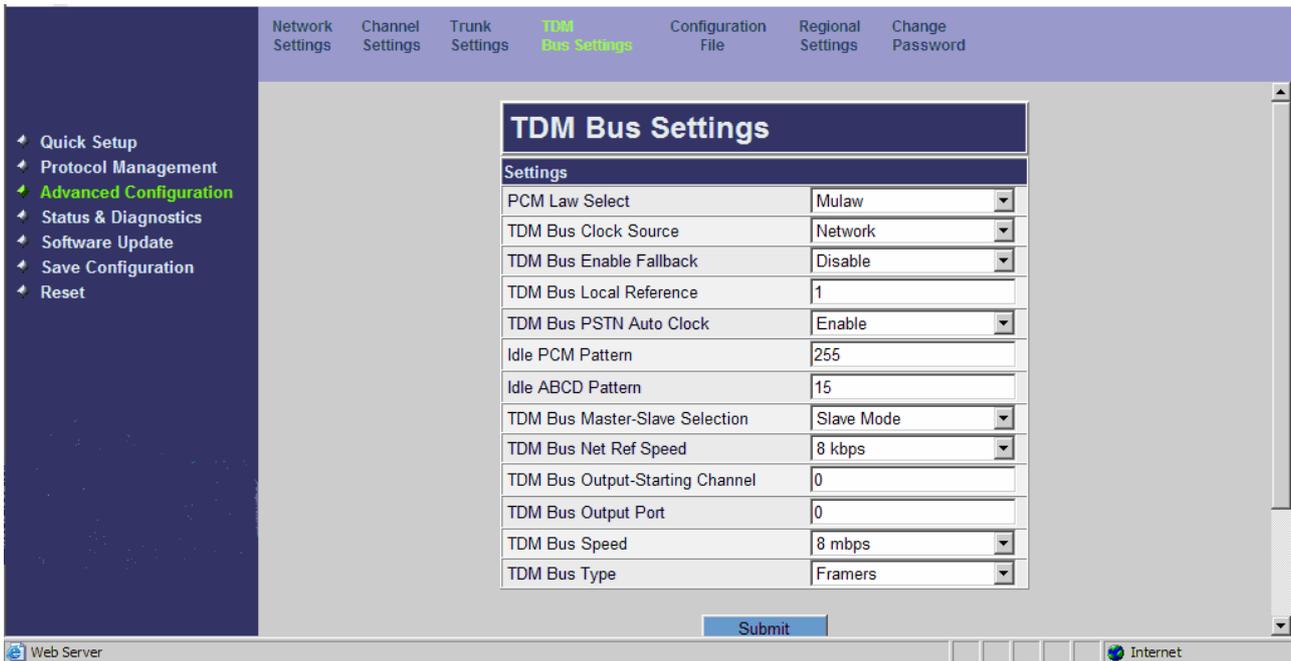

Figure 5-1 - TDM Bus Clock Source Example

The sample screen above shows how to determine in real-time the clock source by looking at the TDM Bus Local Reference. This example shows that the gateway is clocking off span 1 (which corresponds to TDMBusLocalReference = 0). If the clock were to failover (to span 7 in the example INI), the user interface would show an 8. A value of minus 1 (-1) would indicate that the gateway had switched to internal oscillator.

Note: If backup INI files are saved or configuration is burned to flash memory during clock failover, it may have undesired side effects. The TDM Bus Local Reference will assume the real-time value.

6   SS7 Backhaul (M2UA/M2TN)

The MG 3200 can be used to support back-haul of the SS7 signaling links to a remote site. At the remote end, the MG 3200 gateway terminates the PSTN spans and picks off the signaling link(s) and tunnels the MTP2 layer signaling using SCTP over IP to the central site. With M2TN, another MG 3200 is located at the central side, known as the Media Gateway Controller side (MGC side). The remote side is known as the Signaling Gateway side (SG side). The following figure shows the typical configuration of one Trunk Pack Module of the MG 3200. Each MG 3200 contains up to 2 of these modules which operate as independent virtual gateways, each with up to 8 PSTN spans.

Figure 6-1 – M2TN tunneling per Trunk Pack Module (TPM)
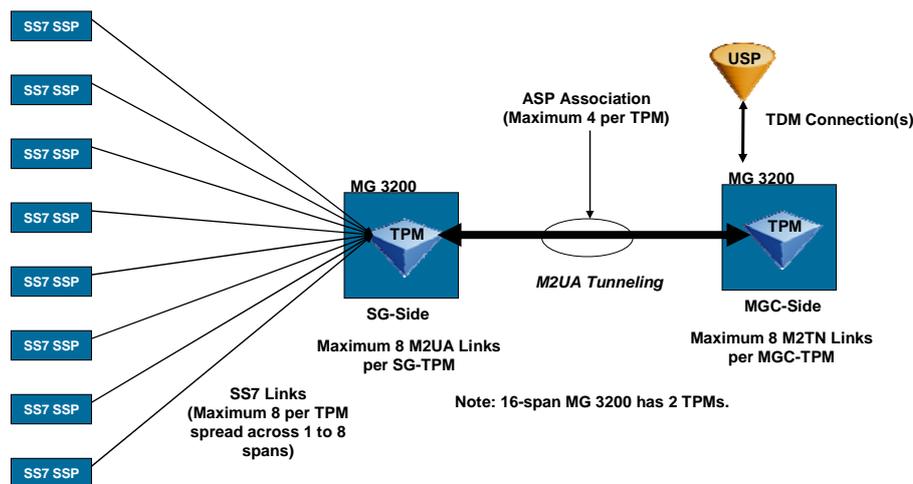
With M2UA, the MG 3200 on the central side is omitted and the IP tunnel terminates on the USP.

The configuration of the remote side is very similar between the M2UA gateway and the M2TN-SG side. Configuration of these gateways is discussed in the next section.

6.1   Configuring SS7 Backhaul remote side by GUI

The SS7 Backhaul remote side can be configured by web interface or using the ini file (described in the next section). The MGC side cannot be configured through the web interface (see next section).

By default, the SS7 web interface does not display. To enable the SS7 web interface, add the following line to the ini file. If this is a new installation, copy the default ini file to a working directory from the installation CD and using an editor (such as notepad) append the following lines to the ini file before loading it on the device.

```
SCTPChecksumMethod = 1

SCTPHBInterval = 200

[ SS7_SIG_IF_GROUP_TABLE ]

FORMAT SS7_SIG_IF_GR_INDEX = SS7_IF_GR_ID,SS7_SIG_SG_MGC,SS7_SIG_LAYER,SS7_SIG_TRAF_MODE;

SS7_SIG_IF_GROUP_TABLE 4 =  4, 83, 2, 1;

[ \SS7_SIG_IF_GROUP_TABLE ]
```

If SS7 backhaul is to be added to an existing configuration, pull back the INI file using the "Get INI" button as described in the procedure at the end of the section titled Locality-Specific Parameters. Append the text above using an editor and reload the INI file to the gateway using the "Send INI File" button (this procedure is described in the User's Guide). Note: You must follow this with a reset with burn to flash.

> **Note**:   The parameter SCTPChecksumMethod = 1 sets the checksum method to CRC32. For M2UA, this parameter must match the setting on the USP (for Adler32 use the value 0). Note also that when using SS7 backhaul and IUA (PRI backhaul) on the same virtual gateway, the value must be 0 (Adler32).

Three main tables describe the configuration, link, group, and interface. These tables form a database which describes the SS7 configuration. Within the database, certain rows refer to other rows, for example, the interfaces and links are contained in groups. Also, the links and interfaces refer to one another by using the fact that each row of the database table has a unique numeric row key. When working with databases of this sort, it is important to maintain referential data integrity by following data integrity rules.

Data integrity rules:

■   Strictly follow the order in the web interface to avoid errors

■   Always add the Group first, Interface second, and Links third

■   Use the reverse order to make changes or deletions

   (Remove the Link, then the Interface, and then the Group)

> **Note**:   To prevent complications arising from referential data errors, follow the sequence of these instructions exactly.

6.1.1   Group Table

The group on the remote side also defines the SCTP port which will be used. There is a naming convention which must be used which follows the convention that GROUP 4 listens on port 2904 and GROUP 5 listens on 2905, etc. The default group is chosen as GROUP 4 because the default port for SS7 backhauling by convention is 2904.

For M2UA, the port will also be defined on the USP.

> **Note**:   If SS7 backhaul is used with IUA, the SIGTRAN group for the IUA uses group 1. Therefore, GROUP_1 can not be used for SS7.

To configure the remote side of the SS7 Backhaul, begin by adding one or more groups by using the following steps:

1. Follow the steps in the previous sections for initial gateway configuration of basic parameters, trunks, and clocking as described in the following sections Basic Configuration, Locality-Specific Parameters, Setting up Trunk Configurations. Note: The trunk used for SS7 backhaul must be one of the Transparent trunks.
2. Begin creating the default group by choosing "SIGTRAN Group ID's" in the pull-down menu under the Advanced_Configuration->SS7_Configuration tab.
3. Continue configuring the default group by choosing 4 in the Group Number pulldown at the top of the frame.
4. If you are editing the default group (Group 4), press the delete button at the bottom of the page to begin editing.
5. Change the "Group ID" to 4. (If you are adding a second group, make sure this number matches the Group_ID selected from the pulldown). Note: The convention must be followed that GROUP_4 uses port 2904 and GROUP_5 uses 2905 as described above.
6. Confirm the following values:

UAL Group Function	SG
Group Layer	M2UA
Group Traffic Mode	Overide
Group Minimal ASP Number	1
Group Behavior Field	0

7. Change the Group Local SCTP to the correct port (2904 for GROUP_4, 2905 for 5, etc.)
8. Set the Group Network Variant to the correct value. In general, ANSI will be used in North America and ITU will be used for Inernational (or also there is also a special setting for China)
9. Confirm the following values:

Group Destination SCTP Port	65534
Group Destination SCTP IP	0.0.0.0
Inbound Streams Number	2
Outbound Streams Number	2

10. Confirm the following values:

Interface Group Timers	
Tr - Group Recovery Timer	2000
Ta - Group Acknowledge Timer	2000
Th - Group Heartbeat Timer	30000

11. Press the "Create" button at the bottom of the screen. There should be a change in the group status indicator at the top of the screen. Instead of the status "Does not Exist", the new status should be "Exists".

12. Repeat steps 3-11 to add more groups (remember to follow the convention with respect to the group numbers and the ports).

13. Reset the gateway (with burn to flash memory selected) to make the change permanent.
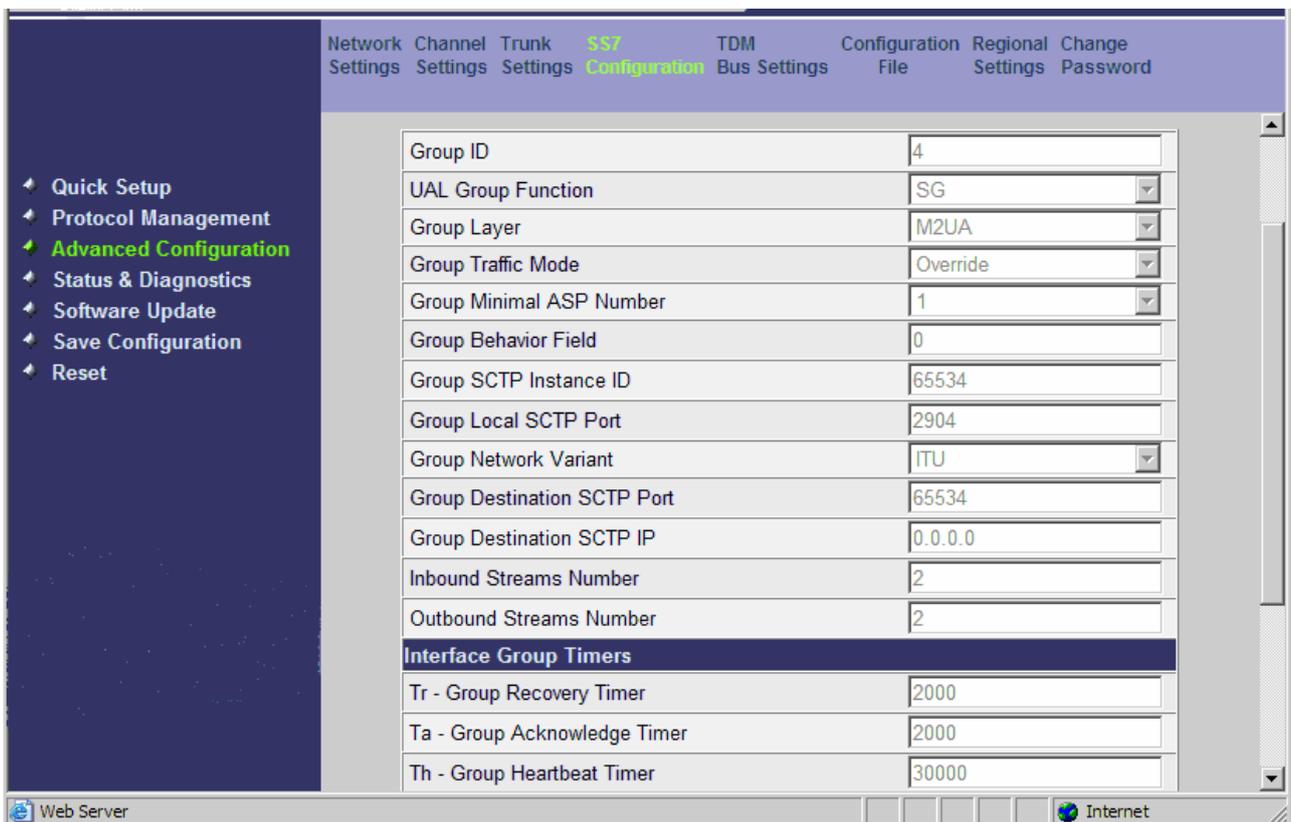
Figure 6-2 – Example Group Screen

6.1.2   Interface Table

The Interface table is a relatively small table which defines the interface ID, name and characteristics. There is a one to one relationship between Link table and Interface table. The Interface ID is also a field in the Link table. The Interface ID joins the interface table to the link table. Also, there is a field in Interface table, the NAI, which references the numeric key of the link table.

> **Note**:   When adding data to the interface table, start using a unique zero-based numeric sequence for the NAI. When the links are added, these will correspond to LINK 0, LINK 1, etc.

Also, the Interface ID's must match end-to-end, in other words for M2UA, they must match the far end ASP (for example, the USP). For M2TN you can define your own scheme matching both ends.   A common convention will be to use the interface numeric key. Each interface will correspond to a channel of SS7 signaling.

Up to four interfaces can be added to a group. Remember that the group an interface is in will determine the port according to the convention as defined in the group table.

Because of these many data inter-relationships, it is helpful to have an overall signaling plan ahead of time and to take detailed notes when making the configuration.

To configure the Interface ID's on the remote side of the SS7 Backhaul, begin by adding one or more interfaces to the existing groups by using the following steps:

1. Begin by choosing "SS7 Sigtran Interface IDs" in the pull-down menu under the Advanced_Configuration->SS7_Configuration tab.
2. Continue configuring the first interface by choosing 0 in the SS7 Sigtran Interface IDs pull-down menu at the top of the frame (if this is not the first Interface, continue by selecting the next available row).
3. Change the "Interface ID" to a meaningful number, for example 0 for Interface 0 (if you are adding a second or third interface, this number might also match the Interface ID selected from the pull-down). Note: For M2UA, the Interface ID should match the configuration at the USP.
4. Change the "Interface Name". This could be any meaningful string. For M2TN, a naming convention like "INTERFACE0" might be used. For M2UA, the Interface ID should match the configuration at the USP. Note: The numeric Interface ID is used in all messaging and this string is meaningful for reference only.
5. Change the "Owner Group" to one of the previously defined groups. Remember that this group will determine the port used. The maximum number of Interfaces in a group is 4.
6. Confirm the following value:

Sigtran Layer Type	M2UA

7. Begin a unique zero-based sequence for the NAI field which will correspond to the key in the LINK table (to be added in the next section). For example, if this is your first interface, use zero, and for the next use 1, and so on. Enter this value for the IF ID NAI field.
8. The M3UA Local Point Code is not used and can be left with the default value.
9. Press the "Create" button at the bottom of the screen. There should be a change in the group status indicator at the top of the screen. Instead of the status "Does not Exist", the new status should be "Exists".
10. Repeat steps 2-8 to add more interfaces. Each interface will correspond to a channel of signaling.
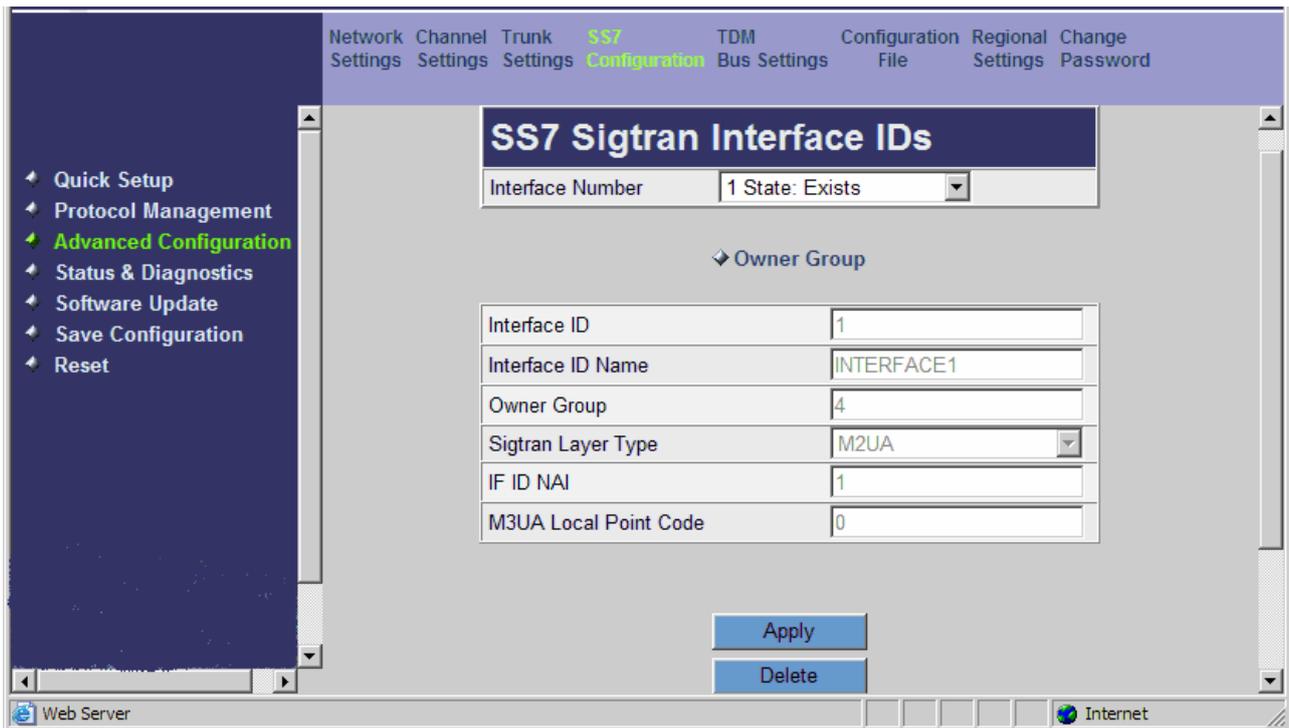
Figure 6-3 – Example Interface Screen

6.1.3 Application Specific Profiles

The following steps should be done based upon the specific application. The section is divided into four sub-sections based upon M2UA or M2TN and E1 or T1 (ITU or ANSI). The values shown are the recommended initial settings for the M2UA timers and parameters. These values can be adjusted at site based upon sound engineering judgment, but the recommended values are presented in this section. These values are taken from the sample INI files in the User's Guide.

There can be up to 4 different profiles to set up different behavior for different links as needed. Normally, only the first Profile (number 0) will be needed. Many links can use the same profile. Each link references its profile through the MTP2 Attributes Index in the link table. These values will normally be 0 (as shown in next section). The profile is divided into a common section, and further on sections specific to the E1 and T1 environments. If the parameters need to be modified after the links have been created (covered in the next section), the links must be deactivated and offline.

Note: If you are configuring M2TN in ITU (E1) network, the gateway default values will all apply (this section can be omitted).

Warning: DO NOT USE the "Activate" button or you will get ERRORS. Configure the Link with Admin_State set to "In Service" and the links will come in service after the gateway is reset.

With the affected links offline, make the following observations and changes as described in the section pertaining to your application:

1. Begin creating the first profile by choosing "MTP2 Attributes" in the pull-down menu under the Advanced Configuration->SS7 Configuration tab.
2. Continue configuring the first profile by choosing 0 in the Profile Number pulldown at the top of the frame (if this is not the first Profile, continue by selecting the next available row).
3. Modify or verify all the referenced settings. Leave other settings at the default values.
4. Repeat steps 2-3 if more than one profile is being used.

Refer to the following definitions within the next sections:

Error Correction Method 0 = No Correction, B = Basic, P = PCR
SS7 SLI Link Rate   A = 64 kbps, D = 56 kbps

If the parameter is not listed in the section, use the default value.

6.1.3.1 M2UA ANSI (T1)

Link Rate	D
Error Correction Method	0
IAC CP	0
SUERM T	0
AERM TIN	0
AERM TIE	0
SUERM SU D	0
Octet Counting	0

MTP2 Timers	
T1	13000
T2 *	11800
T3	11800
T4N	2300
T4E	600
T5	100
T6	3000
T7	1000

```
*T2 for 56k is 11800 (range 5-14). T2 for 64k is 23000 (range 16-30)
```

6.1.3.2 M2TN ANSI (T1)

MTP2 Attributes:

Link Rate	D

MTP2 Timers	
T1	13000
T2 *	11800
T3	11800
T4N	2300
T4E	600
T5	100
T6	3000
T7	1000

```
*T2 for 56k is 11800 (range 5-14). T2 for 64k is 23000 (range 16-30)
```

6.1.3.3 M2UA ITU (E1)

Error Correction Method	0
IAC CP	0
SUERM T	0
AERM TIN	0
AERM TIE	0
SUERM SU D	0

Octet Counting	0

MTP2 Timers	
T1	50000
T2 *	150000
T3	1500
T4N	5000
T4E	500
T5	100
T6	3000
T7	1000

6.1.3.4   M2TN ITU (E1)

Use all default values.

6.1.4   Link Table

The Link table defines the SS7 Links. Within the Link table, the TDM span (port) and timeslot that each SS7 link goes to is defined. Always start with LINK 0 and progress through LINK 7. This is done to correspond with the NAI field in the Interface table. Remember that there is a one to one relationship between Link table and Interface table.

> **Warning**:   DO NOT USE the "Activate" button or you will get ERRORS. Configure the Link with Admin_State set to "In Service" and the links will come in service after the gateway is reset.

To configure the Links on the remote side of the SS7 Backhaul, begin by adding a link for each of the previously defined Interface table rows by using the following steps:

1. Begin creating the first link by choosing "SS7 Links" in the pull-down menu under the Advanced Configuration->SS7 Configuration tab.
2. Continue configuring the first link by choosing 0 in the Link Number pull-down menu at the top of the frame (if this is not the first Link, continue by selecting the next available row).
3. Change the "Link Name" to any meaningful string, for example "LINK0". Note: The link name is simply a matter of convenience and the LINK number is used in all messaging within the MTP2 layer.
4. Confirm the following value:

Trace	0

5. Set the Variant to the correct value. In general, ANSI will be used in North America and ITU will be used for International (or also there is also a special setting for China)
6. Change each of the following fields to the values shown:

Administrative State	In service
Link Type	
Layer 2 Type	MTP2
Layer 3 Type	M2UA SG

7. Configure the Trunk Number and the Timeslot Number for the TDM side. For example, if the SS7 signalling channel for this interface will be coming in on span 5 and channel 16, enter these values.
8. Confirm the follow value:

MTP2 Attributes Index	0

Note: To configure links with varying attribute profiles, reference the profile number (0-3). See previous section for configuring application attribute profiles.

9. Enter the following default values, or use other values that are recommended by network engineers for your application. These values control the congestion behavior of the gateway (when it discards packets) as described in RFC 3331 (refer also to the User's Guide). Note: The High Mark must be greater than the Low mark in all cases.

Congestion Low Watermark	5
Congestion High Watermark	60

10. Change the "Group" to one of the previously defined groups. Remember that this group will determine the port used. The maximum number of Links in a group is 4. Note: The interface table will already be referencing the LINK Number through the field NAI (it must be in the same group as the Interface).
11. Change the "Interface ID" to the ID of the corresponding row in the Interface table. Note that if the numeric key and the Interface ID field differ, it is the ID that is significant. This allows for using very large interface ID's when working with the corresponding data fill on the USP side in M2UA (the Interface ID's must match).
12. Press the "Create" button at the bottom of the screen. There should be a change in the group status indicator at the top of the screen. Instead of the status "Does not Exist", the new status should be "Exists".
13. For each link, press the "In service" button to change the Admin State of the link to "In Service". The link will have an Operational state come into service provided that the central (MGC) side of the SS7 backhaul is configured and operational.
14. Repeat steps 2-13 to add more links. Each link will correspond to a channel of signaling.
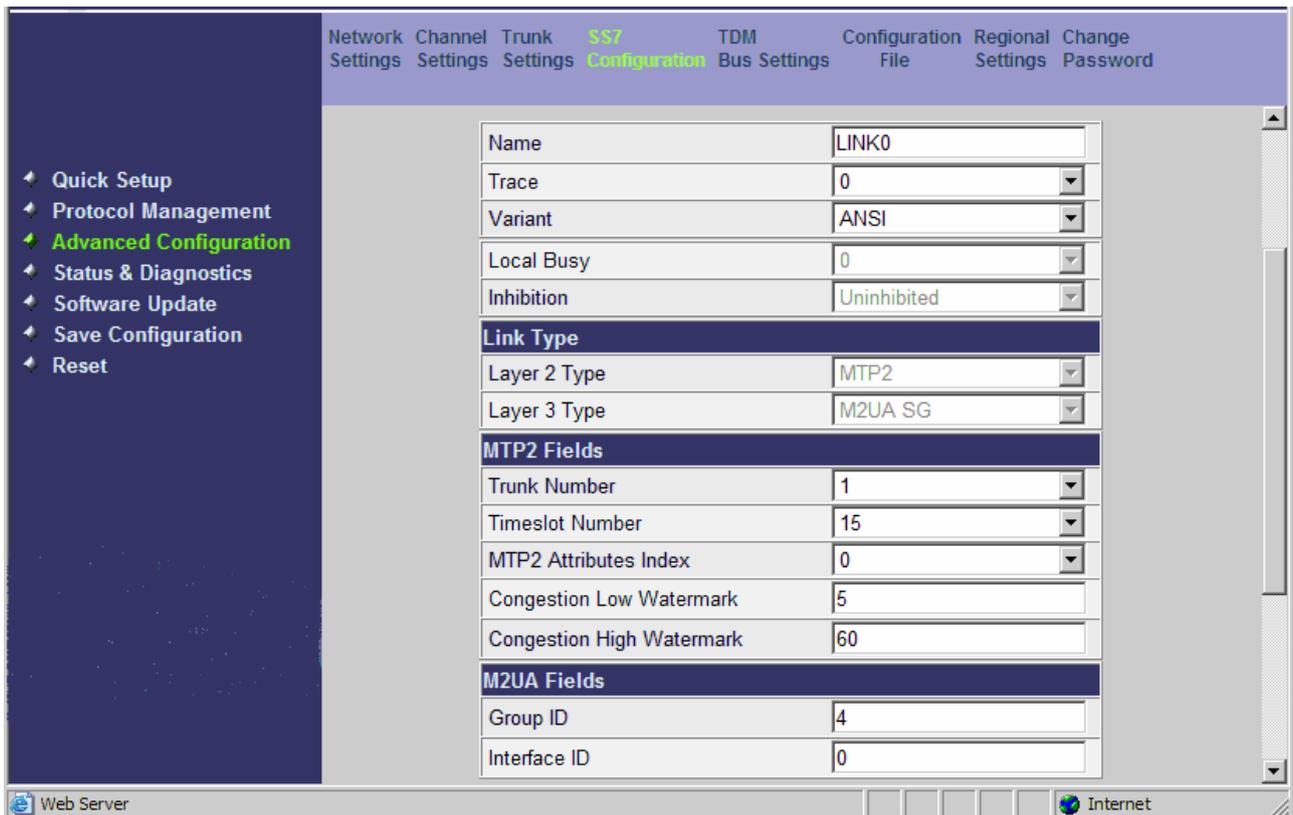
Figure 6-4 – Link table screen

6.2 Maintaining the SS7 Configuration

Backup each satisfactory SS7 backhaul configuration once it is obtained by pulling back the INI file using the "Get INI" button as described in the procedure at the end of the section titled Locality-Specific Parameters. Because of the data integrity rules described in the previous section, it can be difficult to make changes to the gateway through the web interface. It is usually possible to add or delete Groups, Interfaces and Links to a configuration, provided it is done in the correct order. Note that a device reset will be required to add a Group.

It is also possible to make minor adjustments through the web interface, for example to timer values, by taking the element out of service and modifying the data. Note that trunks cannot be taken offline and modified without deleting all the associated Links.

To bypass these restrictions, it is often more convenient to become familiar with the values in the INI file and make modifications to the gateway this way. Note that an INI file with SS7 backhaul tables cannot be sent to the gateway using the "Send INI" button because it will cause referential data integrity problems during loading. You must use the method described in the next section.

> **Warning**: DO NOT USE the "Send INI" method to add or update SS7 backhaul parameters to the gateway or you will get ERRORS.

6.3 Configuring SS7 Backhaul by INI

The recommended method for loading a MG 3200 gateway with new or updated settings set in an INI file is to use the Software Upgrade Wizard. Note that this is the only way to configure the MGC side of the MTP2 tunnel (M2TN). It is also the recommended way to update a gateway when changes are made directly to the INI file. Essentially, the same process which is used for

an upgrade is followed except that the same version of the load is sent along with the modified INI file. The INI file is usually one that has been pulled from the board and modified, or one of the samples from the SS7 appendix of the User's Guide.

> **Note**: Use only the Software Upgrade Wizard to load the configuration on to the MGC side of the MTP2 SS7 backhaul tunneling application (M2TN).

6.3.1   INI Table Basics

Three main tables describe the configuration, link, group, and interface. In the INI file, parameters are set in rows of the table (comma delimited). Tables begin and end with delimiter rows which have the table name enclosed in square brackets. There is a one to one mapping between the data in the INI file tables and the data presented in the configuration GUI. Configuration errors can be seen in the syslog at start up (EX: cannot parse row "LINK 0 = …").

Do not remove or edit the FORMAT rows or other table delimiters. The format row determines the meaning of the subsequent rows in the table. Use the format row to find fields of interest counting the field names and mapping them to the corresponding data fields below.

> **Note**: The format row is a single line below the table name. In the screen shots which follow in the document (and in the User Guide), the format row may have been word-wrapped for presentation. Do not cut and paste these multi-line format rows.

6.3.2   Group Table

The Group table defines the associations. It defines which port the SCTP stream will use and which links will be in which association. Group numbers define many to one relationship. By convention, group 4 uses port 2904 (group 5 -2905, etc.). Port 2904 is the default M2UA port (Group 4 is the default group).

Group table fields common to M2UA and M2TN
  Row/ Group no. – joins the table (use row 4 for group 4 by convention)
  SS7_SIG_SG_MGC – M2TN client or server (83 for SG and M2UA)
  SS7_SIG_LAYER – Use 2 for M2UA (for M2TN-SG and M2UA)
  SS7_SIG_TRAF_MODE – Use 1 for Override (others not supported)
  <timers> with _T – Recovery, Acknowledge, and Heartbeat timers
  SS7_MIN_ASP – Defines the minimum ASP number (use 1)
  SS7_BEHAVIOR – Bit field for future use (use only 0)
  SS7_LOCAL_SCTP_PORT – Defines the port number (2904 in this ex.)
  SS7_SIG_NETWORK - ITU = 1, ANSI = 2, CHINA = 3

  Frequently Changed Parameters in **Bold**

Group Table added fields for MGC side (M2TN)
  SS7_SIG_NETWORK - ITU = 1, ANSI = 2, CHINA = 3
  SS7_DEST_SCTP_PORT – Far side port (must match what is in the SG)
  SS7_DEST_IP – Far side IP address
  SS7_MGC_MX_IN_STREAM – Use 3, SCTP multi-stream redundancy
  SS7_MGC_NUM_OUT_STREAM - Use 3, SCTP multi-stream redundancy

```
[ SS7_LINK_TABLE ]
FORMAT SS7_LINK_INDEX = SS7_LINK_NAME, SS7_LINK_TRACE_LEVEL,
SS7_LINK_ADMINISTRATIVE_STATE,SS7_LINK_L2_TYPE, SS7_LINK_L3_TYPE,
SS7_LINK_TRUNK_NUMBER,SS7_LINK_TIMESLOT_NUMBER,SS7_LINK_M2UA_IF_ID,SS7_LINK_GROUP_ID,SS
7_LINK_MTP2_ATTRIBUTES;
SS7_LINK_TABLE 0 = new_link_0, 0, 2, 1, 1, 6,1, 23, 4, 0;
SS7_LINK_TABLE 1 = new_link_1, 0, 2, 1, 1, 7,1, 24, 4, 0;
[ \SS7_LINK_TABLE ]

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;
;  *** TABLE SS7_SIG_IF_GROUP_TABLE ***
;
;1-SS7_IF_GR_ID,    2-SS7_SIG_SG_MGC,    3-SS7_SIG_LAYER,   4-SS7_SIG_TRAF_MODE,
;5-SS7_SIG_T_REC,    6-SS7_SIG_T_ACK,    7-SS7_SIG_T_HB,   8-SS7_SIG_MIN_ASP,
;9-SS7_SIG_BEHAVIOUR, 10-SS7_LOCAL_SCTP_PORT, 11-SS7_SIG_NETWORK, 12-SS7_DEST_SCTP_PORT,
;13-SS7_DEST_IP,    14-SS7_MGC_MX_IN_STREAM, 15-SS7_MGC_NUM_OUT_STREAM;

[ SS7_SIG_IF_GROUP_TABLE ]
FORMAT SS7_SIG_IF_GR_INDEX = SS7_IF_GR_ID, SS7_SIG_SG_MGC, SS7_SIG_LAYER,
SS7_SIG_TRAF_MODE, SS7_SIG_T_REC, SS7_SIG_T_ACK, SS7_SIG_T_HB, SS7_SIG_MIN_ASP,
SS7_SIG_BEHAVIOUR, SS7_LOCAL_SCTP_PORT, SS7_SIG_NETWORK;
SS7_SIG_IF_GROUP_TABLE 4 = 4, 83, 2, 1, 2000, 2000, 30000, 1, 0, 2904, 1;
[ \SS7_SIG_IF_GROUP_TABLE ]
```

Figure 6-5 - Group table relationships

The figure above shows how Group numbers join the tables, Group 4 will listen on port 2904 for the SCTP association. Several fields are for MGC side only in group table (this is represented by the large empty oval). Use 83 for SS7_SIG_SG_MGC with M2UA and M2TN client (SG side). Note that the format row is a single line (not word wrapped).

6.3.3   Interface Table

The Interface table defines the interface ID, name and characteristics. The Interface ID joins with the Link table. On the remote side, there is a one to one relationship between Link table and Interface table. Group number joins with the group table which defines which links will be in which association (many to one). Interface ID's must match end-to-end. For M2UA, match the far end ASP (for example, the USP). For M2TN user's can define their own scheme matching both ends

 Interface table fields
   Interface ID value – used to uniquely define the interface
   Interface ID name – string used to identify the interface
   Owner Group – Used to define the association (joins to group)
   Layer – Use 2 for M2UA (for M2TN-SG and M2UA)
   NAI – Use a unique sequence starting at 0 (0 .. 1 .. 2 ..) Maps to LINK Index
   M3UA_SPC – Not applicable (use 0)
 Frequently Changed Parameters in **Bold**

Figure 6-6 - Interface table relationships

```
SS7_LINK_TABLE 0 = new_link_0, 0, 2, 1, 1, 6,1, 23, 4, 0;
SS7_LINK_TABLE 1 = new_link_1, 0, 2, 1, 1, 7,1, 24, 4, 0;
[ \SS7_LINK_TABLE ]

[ SS7_SIG_IF_GROUP_TABLE ]
FORMAT SS7_SIG_IF_GR_INDEX = SS7_IF_GR_ID, SS7_SIG_SG_MGC, SS7_SIG_LAYER,
SS7_SIG_TRAF_MODE, SS7_SIG_T_REC, SS7_SIG_T_ACK, SS7_SIG_T_HB, SS7_SIG_MIN_ASP,
SS7_SIG_BEHAVIOUR, SS7_LOCAL_SCTP_PORT, SS7_SIG_NETWORK;
SS7_SIG_IF_GROUP_TABLE 4 = 4, 83, 2, 1, 2000, 2000, 30000, 1, 0, 2904, 1;
[ \SS7_SIG_IF_GROUP_TABLE ]

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
;
;  *** TABLE SS7_SIG_INT_ID_TABLE ***
;
;1-SS7_SIG_IF_ID_VALUE, 2-SS7_SIG_IF_ID_NAME, 3-SS7_SIG_IF_ID_OWNER_GROUP, 4-
SS7_SIG_IF_ID_LAYER,
;5-SS7_SIG_IF_ID_NAI,  6-SS7_SIG_M3UA_SPC;

[ SS7_SIG_INT_ID_TABLE ]
FORMAT SS7_SIG_IF_ID_INDEX = SS7_SIG_IF_ID_VALUE, SS7_SIG_IF_ID_NAME,
SS7_SIG_IF_ID_OWNER_GROUP, SS7_SIG_IF_ID_LAYER, SS7_SIG_IF_ID_NAI, SS7_SIG_M3UA_SPC;
SS7_SIG_INT_ID_TABLE 0 = 23, ETSIM2K_1, 4, 2, 0, 0;
SS7_SIG_INT_ID_TABLE 1 = 24, ETSIM2K_2, 4, 2, 1, 0;
[ \SS7_SIG_INT_ID_TABLE ]
```

The figure above shows how the Group numbers and Interface IDs join the tables (on the remote side there is a one to one relationship with the Link table).

6.3.4   Link Table

The Link table defines the SS7 Links. It specifies the TDM trunk and timeslot that each SS7 link goes to. Always start with LINK 0 and progress through LINK 15. The trunk number and timeslot number are the most likely to change. Remember the trunk is zero-based, 0-7. In the web interface, 0-7 will map to 1-8 for the left virtual gateway or 9-16 on the right virtual gateway.

> **Note**:   When working with the INI files, the trunks (max. 8 trunks) of the virtual gateway will be referenced 0 through 7.

Link table fields
   Link name – for convenience, does not really matter (make unique)
   Trace Level - Always use level 0 when not debugging
   Admin state – Use 2 (active) to brings the link online at startup
   Layer 2 Link Type – Always use 1 (MTP2) for remote side
   Layer 3 Link type – Always use 1 (MTP3) for remote side
   Trunk number – zero based reference to the signalling span
   Timeslot number – range of 1-24 for T1 or 1-31 for E1
   Interface ID – joins this table to the interface definition table.
   Group_ID – joins this table to the association definition (group) table
   MTP2 Attributes – Reference to attribute profile (usually 0)
Frequently Changed Parameters in **Bold**

Figure 6-7 - Link Table References

The trunk number and timeslot number are the most likely to change.
Remember the trunk number is zero-based, 0-7 is 1-8 (or sometimes 9-16)

Note: In the GUI, trunk 0 will display as 1 (or 9 on the right). This example has SS7 backhaul on timeslot 1 of trunks 7 and 8.

6.3.5   Configuring the MGC side of M2TN Tunnel

Before configuring the MGC side of an M2TN application, first configure the SG side. The recommended way to configure the SG side is by using the web interface. Also, read and understand the previous sections which describe in detail the various tables and fields within the INI file.

> **Note**:   The only way to configure the MGC side of the M2TN tunnel is to use the INI file and the Software Upgrade Wizard.

Backup the SG side configuration and make a copy of that backup for editing in a working directory. Many of the data fields will match between the remote (SG) side and the MGC side, so it is most convenient to use the SG side as the baseline template. For example, the INTERFACE table will be exactly the same. The GROUP table will have extra fields to be filled in, but most of the data will be the same. The LINK table will have twice as many rows as before, but the old rows will be similar.

Alternatively, the sample files at the end of the User's Guide, along with the INI file information presented in this and the previous section, can be customized and downloaded using the Software Upgrade Manager procedure (described at the end of this section)

> **Note**: The format row is a single line below the table name. In the screen shots in the User Guide, the format row may have been word-wrapped for presentation. Correct the word wrap when using the sample files from the User Guide.

6.3.5.1 MGC Side Timers

With the MGC side, there are a significant number of timers which need to be added to the INI file. These vary based upon whether the environment is ANSI (T1) or ITU (E1).

For ANSI, open the working copy in an editor such as notepad and locate the start of the LINK table which can be found in a line which will look exactly like the following:
```
[LINK]
```
Add or verify the following parameters immediately **before** the link table.

```
[SS7]
```

```
SS7_MTP2_PARAM_AERM_TIE_0=0
SS7_MTP2_PARAM_AERM_TIN_0=0
SS7_MTP2_PARAM_ERROR_CORRECTION_METHOD_0=B
SS7_MTP2_PARAM_IAC_CP_0=0
SS7_MTP2_PARAM_OCTET_COUNTING_0=0
SS7_MTP2_PARAM_SUERM_SU_D_0=0
SS7_MTP2_PARAM_SUERM_T_0=0
SS7_MTP2_PARAM_TIMER_T1_0=13000
SS7_MTP2_PARAM_TIMER_T2_0=11800
SS7_MTP2_PARAM_TIMER_T3_0=11800
SS7_MTP2_PARAM_TIMER_T4E_0=600
SS7_MTP2_PARAM_TIMER_T4N_0=2300
SS7_MTP2_PARAM_TIMER_T5_0=100
SS7_MTP2_PARAM_TIMER_T6_0=3000
SS7_MTP2_PARAM_TIMER_T7_0=1000
```

For ITU, open the working copy in an editor such as notepad and locate the start of the LINK table which can be found in a line which will look exactly like the following:
```
[LINK]
```
Add or verify the following parameters immediately **before** the link table.
```
[SS7]
```

```
SS7_MTP2_PARAM_TIMER_T1_0=50000
SS7_MTP2_PARAM_TIMER_T2_0=150000
SS7_MTP2_PARAM_TIMER_T3_0=1000
SS7_MTP2_PARAM_TIMER_T4E_0=500
SS7_MTP2_PARAM_TIMER_T4N_0=8200
SS7_MTP2_PARAM_TIMER_T5_0=100
SS7_MTP2_PARAM_TIMER_T6_0=3000
SS7_MTP2_PARAM_TIMER_T7_0=2000
```

6.3.5.2 Link Table (MGC side)

On the MGC side, two LINK rows are required for each channel of signaling, one for the TDM side and one for the tunnel. The rows for the TDM side are identical to those on the remote side and should already exist in the file. The link table used for this example has 2 rows (there may be more or less rows in your configuration. Therefore, we will be adding another 2 rows to the LINK table.

Open the working copy in an editor such as notepad and locate the start of the LINK table which can be found in a line which will look exactly like the following:

`[LINK]`

1. Change the L2_TYPE field (fifth field) in all of the existing LINK table rows as shown.

2. Change the L3_TYPE field (sixth field) in all of the existing LINK table rows as shown.

3. Change the SS7_LINK_TNL_ALIGNMENT_MODE field (sixteenth field) in all of the existing LINK table rows as shown.

```
SS7_LINK_TABLE 0 = new_link_0, 255, 2, 0, 1, 1, 0, 1, 2, 0, 5, 60, 50, 4, 0, 0, 0, 30000, 5000, 30000;
SS7_LINK_TABLE 1 = new_link_1, 255, 2, 0, 1, 1, 0, 2, 2, 0, 5, 60, 12, 4, 0, 0, 0, 30000, 5000, 30000;
```

Becomes:

```
SS7_LINK_TABLE 0 = new_link_0, 255, 2, 0, 2, 3, 0, 1, 2, 0, 5, 60, 50, 4, 0, 1, 0, 30000, 5000, 30000;
SS7_LINK_TABLE 1 = new_link_1, 255, 2, 0, 2, 3, 0, 2, 2, 0, 5, 60, 12, 4, 0, 1, 0, 30000, 5000, 30000;
```

2. Then, Add LINK table rows by copying and pasting one row for each of the existing rows.

```
SS7_LINK_TABLE 2 = new_link_2, 255, 2, 0, 1, 3, 0, 1, 2, 0, 5, 60, 50, 4, 0, 0, 0, 30000, 5000, 30000;
SS7_LINK_TABLE 3 = new_link_3, 255, 2, 0, 1, 3, 0, 2, 2, 0, 5, 60, 12, 4, 1, 0, 0, 30000, 5000, 30000;
```

Some notes about the added rows, see the underlined fields above (note the fields do not need to be underlined in the actual file). The table index (2 and 3 in this example), should be changed to follow a unique zero-based sequence which continues from the end of the existing rows. In this example, there are two existing rows, 0 and 1, so the added rows will be 2 and 3. If the existing configuration had 4 rows (0-3), the new rows would need to be 4, 5, 6, and 7 and so on. Also, change the link name (field 1), making it unique. The SS7_LINK_L3_TYPE (fifth field) should be changed to 1 in the new rows. The SS7_LINK_TNL_MGC_LINK_NUMBER (fifteenth field, sixth from the end) will need to reference each of the indexes of the existing rows. In other words, in the added rows, this essentially is a new sequence of zero-based index numbers. This is how the new rows (the IP tunnel rows) cross-reference with the existing rows (the TDM rows).

Note also the difference in values between the new and old rows in the sixteenth field.

Further explanation of the Link Table Format

1 - SS7_LINK_NAME – for convenience, does not really matter (make unique)
2 - SS7_LINK_RDCY_BOARD – Not used (use 255)
3 - SS7_LINK_ADMINISTRATIVE_STATE – Use 2 (active) to brings the link online at startup
4 - SS7_LINK_TRACE_LEVEL - Always use level 0 when not debugging

5 - SS7_LINK_L2_TYPE - Use 1 for existing, use 2 for new rows (1 = MTP2, 2 = M2UA_MGC)

6 - SS7_LINK_L3_TYPE – Use 3 (3 = MTP2_TUNNELING)

7 - SS7_LINK_TRUNK_NUMBER – zero based reference to the signaling span

8 - SS7_LINK_TIMESLOT_NUMBER – range of 1-24 for T1 or 1-31 for E1

9 - SS7_LINK_LAYER2_VARIANT - ITU = 1, ANSI = 2, CHINA = 3

10- SS7_LINK_MTP2_ATTRIBUTES – Usually 0 (or 1-3 for multiple profiles)

11 - SS7_CONGESTION_LOW_MARK – Use 5 (must be lower than high)

12 - SS7_CONGESTION_HIGH_MARK – Use 60

13 - SS7_LINK_M2UA_IF_ID – references the Interface table (by matching of ID field)

14 - SS7_LINK_GROUP_ID – references the Group table (by matching the ID filed)

15 - SS7_LINK_TNL_MGC_LINK_NUMBER – Index of TDM side row this row pairs with

16 - SS7_LINK_TNL_ALIGNMENT_MODE – Use 1 (EMERGENCY) in the existing rows

17 - SS7_LINK_TNL_CONGESTION_MODE – Use 0 (ACCEPT)

18 - SS7_LINK_TNL_WAIT_START_COMPLETE_TIMER – Use 30000

19 - SS7_LINK_TNL_OOS_START_DELAY_TIMER – Use 5000

20 - SS7_LINK_TNL_WAIT_OTHER_SIDE_INSV_TIMER – Use 30000

The **bold** fields indicate fields which are applicable only to the TDM side (existing rows).

> **Warning**: DO NOT USE the "Activate" button or you will get ERRORS. Configure the Link with Admin_State set to "In Service" and the links will come in service after the gateway is reset.

6.3.5.3 Group Table (MGC side)

There will be at least one or more rows in the group table in the M2TN baseline configuration file pulled from the remote (SG) side.

Open the working copy in an editor such as notepad and locate the start of the GROUP table which can be found in a line which will look exactly like the following:
`[GROUP]`

1. Change the SS7_SIG_LAYER field (second field) from 83 to 77

2. Change the SS7_SIG_LAYER field (third field) from 2 to 4

3. Change the SS7_DEST_SCTP_PORT from 65534 to match the LOCAL port (EX: 2904)

4. Change the SS7_DEST_IP from 0.0.0.0 to the IP address of the remote side (M2TN-SG).

5. Change the SS7_MGC_MX_IN_STREAM from 2 to 3.

6. Change the SS7_MGC_NUM_OUT_STREAM from 2 to 3.

`SS7_SIG_IF_GROUP_TABLE 4 = 4, `**`83`**`, `**`2`**`, 1, 2000, 2000, 30000, 1, 0, 2904, 2, `**`65534`**`, `**`0.0.0.0`**`, `**`2`**`, `**`2`**`;`

Becomes:

`SS7_SIG_IF_GROUP_TABLE 4 = 4, `**`77`**`, `**`4`**`, 1, 2000, 2000, 30000, 1, 0, 2904, 2, `**`2904`**`, `**`#.#.#.#`**`, `**`3`**`, `**`3`**`;`

Group table fields

1 - SS7_IF_GR_ID – joins the table (use row 4 for group 4 by convention)

2 - SS7_SIG_SG_MGC – Use 77 for M2TN MGC server (83 for SG and M2UA)

3 - SS7_SIG_LAYER – Use 4 for MTP2_TUNNEL (2 for M2TN-SG and M2UA)

4 - SS7_SIG_TRAF_MODE – Use 1 for Override (others not supported)

5 – SS7_SIG_T_REC

6 - SS7_SIG_T_ACK

7 - SS7_SIG_T_HB

8 - SS7_MIN_ASP – Defines the minimum ASP number (use 1)

9 - SS7_BEHAVIOR – Bit field for future use (use only 0)

10 - SS7_LOCAL_SCTP_PORT – Defines the port number (2904 in this ex.)

11 - SS7_SIG_NETWORK - ITU = 1, ANSI = 2, CHINA = 3

12 - SS7_DEST_SCTP_PORT - Defines the remote side port number (2904 in this ex.)

13 - SS7_DEST_IP – Remote side IP address

14 - SS7_MGC_MX_IN_STREAM – SCTP stream control protocol parameter

15 - SS7_MGC_NUM_OUT_STREAM - SCTP stream control protocol parameter

6.3.5.4 Interface Table (MGC side)

The interface tables should match exactly between the MGC side and the SG side in most cases (any differences are for the unique situation discussed in the next section)

6.3.5.5 Many to one relationships

The MGC side server can be configured to serve several remote offices within the capacity limitations discussed in the user's guide. When configuring the MGC side for more than one remote MG 3200 SG gateway, additional rows are added to the GROUP table with the significant difference being the IP address and port of the remote gateway. Rows in the LINK table and INTERFACE table are also added to correspond to the rows in the remote side gateways. The following guidelines must be used:

- Follow the group numbering convention that GROUP 4 is port 2904, GROUP 5 is 2905, etc. on both sides of the tunnel

- Use a unique numbering scheme for the Interface ID's and ensure that the Interface ID's match at both ends of the tunnel

6.4 Loading the INI file with SS7 Settings

Because of the data integrity rules described previous sections, an INI file with SS7 backhaul tables cannot be sent to the gateway using the "Send INI" button because it will cause referential data integrity problems during loading.

> **Warning**:   DO NOT USE the "Send INI" method to add or update SS7 backhaul parameters to the gateway or you will get ERRORS.

The recommended method for loading a MG 3200 gateway with new or updated settings set in an INI file is to use the Software Upgrade Wizard. Note that this is the only way to configure the MGC side of the MTP2 tunnel (M2TN).

> **Note**:   Use only the Software Upgrade Wizard to load the configuration file which has been edited with an editor. (for example the MGC side of the MTP2 SS7 backhaul tunneling application (M2TN)).

The Software Upgrade Wizard is kicked off from the Software_Update->Software_Upgrade_Wizard tab of the GUI. Essentially, the same process which is used for an upgrade is followed except that the same version of the load is sent along with the modified INI file. This procedure is covered thoroughly in the MG 3200 User's Guide. In most circumstances, it is possible to send the CMP file and the INI file (be sure to uncheck the "Use previous Configuration" checkbox). Then, the process can be cut short by pressing the "Reset" button in the screen which says "INI file successfully loaded to device". It is only necessary to go all the way through the Wizard process when there are other Auxiliary Files (for example a Call Progress Tones) file which also must be loaded.
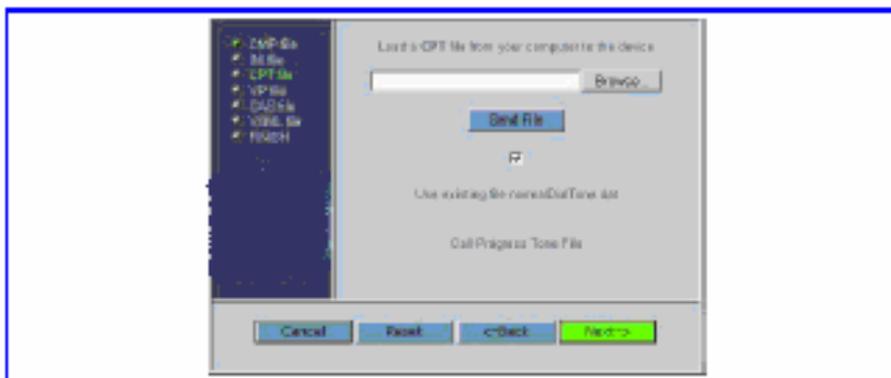

Figure 6-8 - Software Upgrade Wizard Example

After the gateway resets, check the configuration as described in the following sections. Also, backup each satisfactory SS7 backhaul configuration once it is obtained by pulling back the INI file using the "Get INI" button as described in the procedure at the end of the section titled Locality-Specific Parameters. Inspect the INI file carefully. If there have been any errors in the loading of the configuration, these will most likely be missing from the pulled back INI file (having been rejected on loading).

Fix any errors in the original file and repeat the process until it loads cleanly.

6.5   Checking the SS7 Backhaul Configuration

6.5.1   Syslogs

With the syslog server operational, reboot each gateway by pressing the Reset button (in the web GUI).

Check the syslog. There is a great deal of information upon reboot, but check for errors. Specifically, check for configuration errors caused by invalid or incompatible SS7 information. Here is an example:

```
05/23 14:13:35.541 : 192.168.10.81 : WARNING : Table SS7_LINK_TABLE: invalid line - failed to parse
parameter 2 (SS7_LINK_RDCY_BOARD) - val: 255. [Code:40052]

05/23 14:13:35.551 : 192.168.10.81 : WARNING :  ==>Errored Line: SS7_LINK_TABLE 0 = new_link_0, 255, 2,
0, 1, 1, 1, 1, 1, 3, 5, 60, 10, 4, 0, 0, 0, 30000, 5000, 30000; [Code:40052]
```

It is usually possible to correct configuration errors using the information provided. Common errors are invalid field values (like this example), invalid referential data (for example LINK is in a GROUP which doesn't exist), duplication, or improper format (wrong number of fields). To work through problems of this nature, it may be necessary to go through several iterations; modify INI file, load INI file through Software Upgrade Wizard (board is reset), check syslogs.

In the event of PSTN problems, there may also be information in the syslog.

```
06/13 11:39:02.995 : 192.168.20.47 : INFO    : *** SS7 ***  Link 2 is BUSY

06/13 11:39:03.226 : 192.168.20.47 : INFO    : *** SS7 ***  Link 1 is BUSY

06/13 11:39:03.226 : 192.168.20.47 : INFO    : *** SS7 ***  Link 0 is BUSY

06/13 11:39:03.226 : 192.168.20.46 : INFO    : *** SS7 ***  Link 12 is BUSY

06/13 11:39:03.226 : 192.168.20.46 : INFO    : *** SS7 ***  Link 10 is BUSY

06/13 11:39:03.226 : 192.168.20.46 : INFO    : *** SS7 ***  Link 8 is BUSY
```

With error free configuration at both ends (MGC and SG), the tunnel should come up. Upon reset of either end a series of syslogs will be seen which indicate the IP side has connected (SCTP).

```
06/13 12:02:58.496 : 192.168.20.46 : NOTICE  : [PType=9] SCTP association 28204 is up   [CID:0]

06/13 12:02:58.516 : 192.168.10.150 : NOTICE  : [PType=9] SCTP association 15456 is up   [CID:0]

06/13 12:02:58.546 : 192.168.20.47 : NOTICE  : [PType=9] SCTP association 7845 is up   [CID:0]

06/13 12:02:58.566 : 192.168.10.150 : WARNING : *** M2TN INFO: SCTP connection is OK Sending ASP-UP.
INST_ID: 0, assoc: 15456, GROUP_ID 4 (0). [Trunk:-1 Bchannel:-1 ConnID:-1] [Code:777 Line:467]

06/13 12:02:58.586 : 192.168.10.150 : WARNING : UP OK assoc_id   15456 with   instance 0 [Trunk:-1
Bchannel:-1 ConnID:-1] [Code:777 Line:196]

06/13 12:02:58.616 : 192.168.10.150 : NOTICE  : [PType=9] SCTP association 14813 is up   [CID:0]

06/13 12:02:58.646 : 192.168.10.150 : WARNING : *** M2TN INFO: SCTP connection is OK Sending ASP-UP.
INST_ID: 1, assoc: 14813, GROUP_ID 5 (1). [Trunk:-1 Bchannel:-1 ConnID:-1] [Code:777 Line:467]

06/13 12:02:58.666 : 192.168.10.150 : WARNING : UP ?? assoc_id param  14813 but  assoc_id in DB  15456
[Trunk:-1 Bchannel:-1 ConnID:-1] [Code:777 Line:209]

06/13 12:02:58.686 : 192.168.10.150 : WARNING : UP ?? instance_id  param  1 but  assoc_id in DB  0
[Trunk:-1 Bchannel:-1 ConnID:-1] [Code:777 Line:210]

06/13 12:02:58.706 : 192.168.10.150 : WARNING : UP OK assoc_id   14813 with   instance 1 [Trunk:-1
Bchannel:-1 ConnID:-1] [Code:777 Line:196]
```

```
06/13 12:02:58.716 : 192.168.10.150 : WARNING : *** M2TN INFO: ASP is UP. Sending ASP-ACTIVE. INST_ID: 0,
assoc: 15456, GROUP_ID 4 (0). [Trunk:-1 Bchannel:-1 ConnID:-1] [Code:777 Line:490]

06/13 12:02:58.726 : 192.168.10.150 : WARNING : active OK assoc_id  15456 with  instance 0 [Trunk:-1
Bchannel:-1 ConnID:-1] [Code:777 Line:237]

06/13 12:02:58.726 : 192.168.10.150 : WARNING : *** M2TN INFO: ASP is UP. Sending ASP-ACTIVE. INST_ID: 1,
assoc: 14813, GROUP_ID 5 (1). [Trunk:-1 Bchannel:-1 ConnID:-1] [Code:777 Line:490]

06/13 12:02:58.736 : 192.168.10.150 : WARNING : active ?? assoc_id param  14813 but  assoc_id in DB
15456 [Trunk:-1 Bchannel:-1 ConnID:-1] [Code:777 Line:250]

06/13 12:02:58.746 : 192.168.10.150 : WARNING : active ?? instance_id  param  1 but  assoc_id in DB  0
[Trunk:-1 Bchannel:-1 ConnID:-1] [Code:777 Line:251]

06/13 12:02:58.756 : 192.168.10.150 : WARNING : active OK assoc_id  14813 with  instance 1 [Trunk:-1
Bchannel:-1 ConnID:-1] [Code:777 Line:237]


06/13 12:02:58.756: 192.168.10.150: INFO    : *** SS7 ***  Link 2 is INSERVICE

06/13 12:02:58.756: 192.168.10.150: INFO    : *** SS7 ***  Link 1 is INSERVICE

06/13 12:02:58.756: 192.168.10.150: INFO    : *** SS7 ***  Link 0 is INSERVICE

06/13 12:02:58.756: 192.168.10.150: INFO    : *** SS7 ***  Link 12 is INSERVICE

06/13 12:02:58.756: 192.168.10.150: INFO    : *** SS7 ***  Link 10 is INSERVICE

06/13 12:02:58.756: 192.168.10.150: INFO    : *** SS7 ***  Link 8 is INSERVICE
```

6.5.2   Configuration Check

Even after configuring the SS7 backhaul through the INI file, it is still possible to use the configuration GUI to do a read-only check. Here is a sample of the MGC side screens:

SS7 Sigtran Group IDs	
Group Number	4
Index	4

Group ID	4
UAL Group Function	MGC
Group Layer	MTP2 Tunnel
Group Traffic Mode	Overide
Group Minimal ASP Number	1
Group Behavior Field	0
Group SCTP Instance ID	0
Group Local SCTP Port	2904
Group Network Variant	ANSI
Group Destination SCTP Port	2904
Group Destination SCTP IP	192.168.10.152
Inbound Streams Number	3
Outbound Streams Number	3
Interface Group Timers	
Tr - Group Recovery Timer	2000
Ta - Group Acknowledge Timer	2000
Th - Group Heartbeat Timer	30000

Figure 6-9 - MGC Side Sample Group

SS7 Sigtran Interface IDs

Interface Number	7

Interface ID	50
Interface ID Name	BELFAST
Owner Group	4
Sigtran Layer Type	M2UA
IF ID NAI	1
M3UA Local Point Code	0

Figure 6-10- MGC Side Interface Example

SS7 Links

Link Number	0:State Exists
Administrative State: In Service (GREEN)	Operational State: In Service (GREEN)

Name	new_link_0
Trace	0
Variant	ANSI
Local Busy	0
Inhibition	Uninhibited
Link Type	
Layer 2 Type	MTP2
Layer 3 Type	MTP2 Tunneling
MTP2 Fields	
Trunk Number	1
Timeslot Number	1
MTP2 Attributes Index	0
Congestion Low Watermark	5
Congestion High Watermark	60

Figure 6-11 - MGC Side Sample TDM side Link

SS7 Links	
Link Number	0:State Exists
Administrative State: In Service (GREEN)	Operational State: Busy(RED)*

Name	new_link_1
Trace	0
Variant	ANSI
Local Busy	0
Inhibition	Uninhibited
Link Type	
Layer 2 Type	M2UA MGC
Layer 3 Type	MTP2 Tunneling
M2UA Fields	
Group ID	4
Interface ID	50

Figure 6-12 - MGC Side Sample MGC side Link

- Note: The correct operational state is shown (GREEN) only in the TDM link (previous screen). The status in this screen shows Operational State Busy (RED) in error (ignore this status)

Warning: DO NOT USE the "Activate" button or you will get ERRORS. Configure the Link with Admin_State set to "In Service" and the links will come in service after the gateway is reset.

6.5.3   Channel Status

The SS7 backhaul configuration is also shown in the GUI under Status&Diagnostics->Channel Status with a purple icon for each channel. Note that the purple icon indicates only that SS7 is configured. The link status is shown under Advanced_Configuarion->SS7 Configuration as described previously.
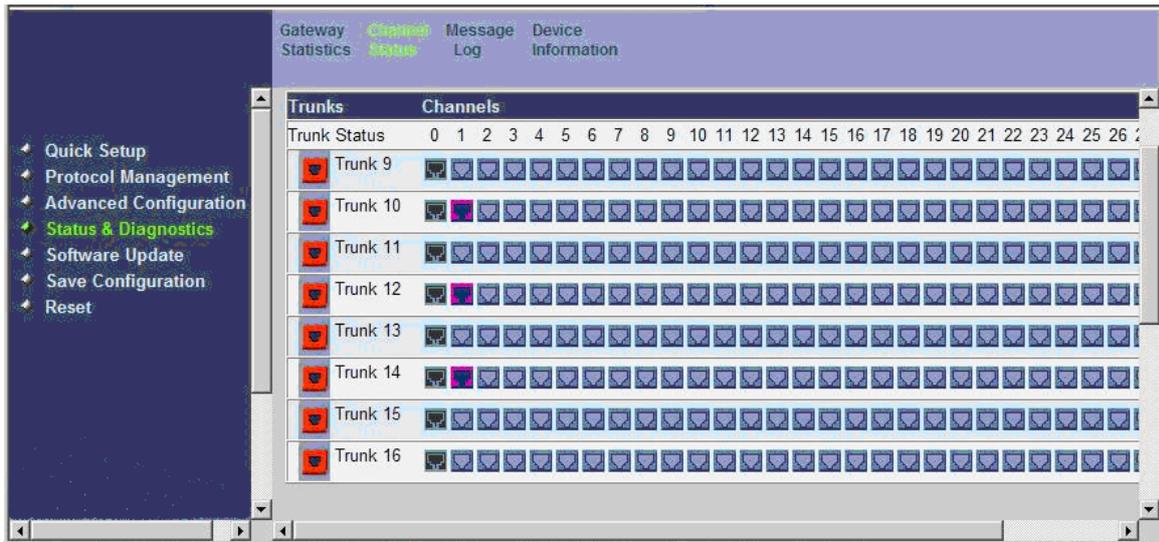
Figure 6-13 - Channel Status showing SS7

7   Gateways behind a NAT

7.1   Basic NAT Configuration

When configuring a MG 3200 gateway behind a NAT, add the following parameters to the INI file before loading it in the gateway:

```
EnableStun = 1
```

MEGACO_MID – This parameter defines the media gateway's MID towards the H.248 Call Agent. The MID of messages sent by the gateway must match the provisioned name of the gateway on the CS2000 Management Tools when it is behind the NAT. The FQDN of the gateway is suggested for use here. Example:
```
MEGACO_MID = 'MG3200'
```

There are also several other options for traversing a NAT. These depend on the application and are described briefly below:

SCTPHOSTNAME - When set to any value other than an empty string, SCTP (Stream Control Transmission Protocol) uses the value as the value of the FQDN (Fully Qualified Domain Name) parameter attached to the INIT chunk. In this case, the FQDN parameter replaces any IP address parameters in the INIT chunk. This overcomes NAT problems where the original IP addresses belonging to the endpoint supports are converted into pseudo addresses. When this parameter is not set (default), the INIT chunk is sent without any FQDN parameter. Default (NULL). Example:

```
SCTPHOSTNAME = 'MG3200'
```

SendKeepAliveTrap - When Enabled, this parameter invokes the keep-alive trap and sends it out every 9/10 of the time defined in the parameter defining NAT Binding Default Timeout. Default   = 0(Disabled)

NOTE: With STUN enabled, there are other ways to enable the trap. T– this trap is designed to be a constant life signal from the device to the manager allowing the manager NAT traversal at all times. The acBoardTrapGlobalsAdditionalInfo1 varbind has the device's serial number.
    The Trap is instigated in three ways:

- Via the ini file parameter - 'SendKeepAliveTrap = 1'. This ensures that the trap is continuously sent. The frequency is set via the 9/10 of the NATBINDINGDEFAULTTIMEOUT (or MIB object - acSysSTUNBindingLifeTime) parameter.

- After the STUN client has discovered a NAT (any NAT).

- If the STUN client can not contact a STUN server.

⚠️	Note: The two latter options require the STUN client be enabled (*ini* file parameter EnableSTUN). Also, once the acKeepAlive trap is instigated it does not stop.

NATBindingDefaultTimeout - Defines the NAT binding lifetime, in seconds. STUN refreshes the binding information after this time expires. Default 30. Range = 0 to 2592000.

For more information, consult the SN09 MG 3200 H.248 User's Guide.

7.2   Support for IUA/DUA behind a NAT

To be able to support IUA/DUA signaling gateway functionality behind a NAT, the signaling gateway must initiate SCTP (by sending an SCTP init to the MGC side). After an SCTP association is established, the Signaling Gateway waits for ASP commands from the MGC. This is performed via a new configuration of the following line in the SS7_SIG_IF_GROUP table. To configure the connection of an IUA behind a NAT, refer to the following example.

Please add the following lines to your INI file: Change the IP in red to your MGC IP address.

[SS7_SIG_IF_GROUP_TABLE]

FORMAT SS7_SIG_IF_GR_INDEX = SS7_IF_GR_ID,SS7_SIG_SG_MGC, SS7_SIG_LAYER, SS7_SIG_TRAF_MODE, SS7_SIG_T_REC, SS7_SIG_T_ACK, SS7_SIG_T_HB, SS7_SIG_MIN_ASP, SS7_SIG_BEHAVIOUR, SS7_LOCAL_SCTP_PORT, SS7_SIG_NETWORK, SS7_DEST_SCTP_PORT, SS7_DEST_IP, SS7_MGC_MX_IN_STREAM, SS7_MGC_NUM_OUT_STREAM;

SS7_SIG_IF_GROUP_TABLE 1 = 1,1, 1, 1, 2000, 2000, 30000, 1, 0, 9900, 1,9900,10.3.2.45,3,3;

> **Note**: The two values 3,3 at the end of the entry of the SS7_SIG_IF_GROUP_TABLE parameter controls the number of in and out SCTP streams to open. This MUST be the number of E1/T1 ports + 1 at a minimum. The reason is because in RFC3057, Stream 0 is reserved for ASP/MGMT messages, and each E1/T1 uses a different stream.
>
> Example: For an 8-port MG3200 communicating via NAPT, the values would be 9,9

[\SS7_SIG_IF_GROUP_TABLE]

SCTPHOSTNAME = 'MG3200'

MEGACO_MID = 'MG3200'

> **Note**: The SCTPHOSTNAME parameter must match the MEGACO_MID parameter which must match the gateway name provisioned in CS2000 Management Tools and must only be used in NAPT configurations. The hostname is used to identify the gateway to the CS2000 since IP address cannot be used.
>
> The value 'MG3200' in the example above is the provisioned gateway name on the CS2000 Management Tools.

8   Configuring MG3200 HTTPS Proxy for Nortel IEMS Interworking

The following steps are the prerequisites set up for launching MG 3200 Configuration GUI from Nortel IEMS:

1. Configure the MG3200 HTTPS proxy

1. Telnet to the IEMS server with root account.

2. Issue "cli" command

```
> cli
```

3. Select Configuration (option 2) --> Apache Proxy Configuration (option 2) --> add_proxy_conf (option 1)

Command Line Interface

 1 - View

 2 - Configuration

 3 – Other

 X - exit

select - *2*

Configuration

 1 - NTP Configuration

 2 - Apache Proxy Configuration

 3 - OAMP Application Configuration

 4 - CORBA Configuration

 5 - IP Configuration

 6 - DNS Configuration

 7 - Syslog Configuration

 8 - Remote Backup Configuration

 9 - Database Configuration

10 - NFS Configuration

11 - Bootp Configuration

12 - Restricted Shell Configuration

13 - Security Services Configuration

14 - Disk Drive Upgrade

15 - Login Session

16 - Location Configuration

17 - Cluster Configuration

18 - Succession Element Configuration

19 - snmp_poller (SNMP Poller Configuration)

20 - backup_config (Backup Configuration)

 X - exit

select - *2*

Apache Proxy Configuration
 1 - add_proxy_conf (Add an IP to the Apache Proxy Module configuration)
 2 - del_proxy_conf (Delete an IP from the Apache Proxy Module configuration)
 3 - list_proxy_conf (List the Apache Proxy Module configuration)

 X - exit

select - *1*

4. Provide the IP address for the MG3200 as following (example used here: 47.142.134.127).

=== Executing "add_proxy_conf"

Enter proxy IP address (X to exit): *47.142.134.127*

Enter hostname/tag associated with IP 47.142.134.127: *47.142.134.127*

Optional, enter remote hostname/tag associated with IP 47.142.134.127:

Enter port number [443]:

Accept the following values:

   IP Address = 47.142.134.127

   Hostname   = 47.142.134.127

   Remote Tag =

   Port Num   = 443

!!WARNING!! This will result in WEBSERVER going down (restarting) for a short time

Continue? [Y/N]: *Y*

2. Configure the 'HTTP Authentication Mode' parameter on the MG3200:

1. Access the Web Server Interface (refer to section "Accessing the Embedded Web Server" of the document 'MG 3200 H_248 User's Manual')

2. Enter the Administrator level **Username** (default: **Admin**) and **Password** (default: **Admin**).

Note: The Username and Password fields are case-sensitive.

3. Click **OK.** The Quick Setup screen appears.

4. From the main menu list on the left, click on the **Advanced Configuration** link. The Advanced Configuration screen appears.

From the sub-menu bar on the top, move the cursor on the **Network Settings** link. A drop-down menu appears. Click the **Security Settings** option. The Security Settings screen appears.

5. Set the parameter 'HTTP Authentication Mode' to the value 'Basic if HTTPS, Digest if HTTP'.

The parameter 'Require Secured Web Connection (HTTPS)' should remain to be set with the default value 'Disable (HTTP and HTTPS)'.
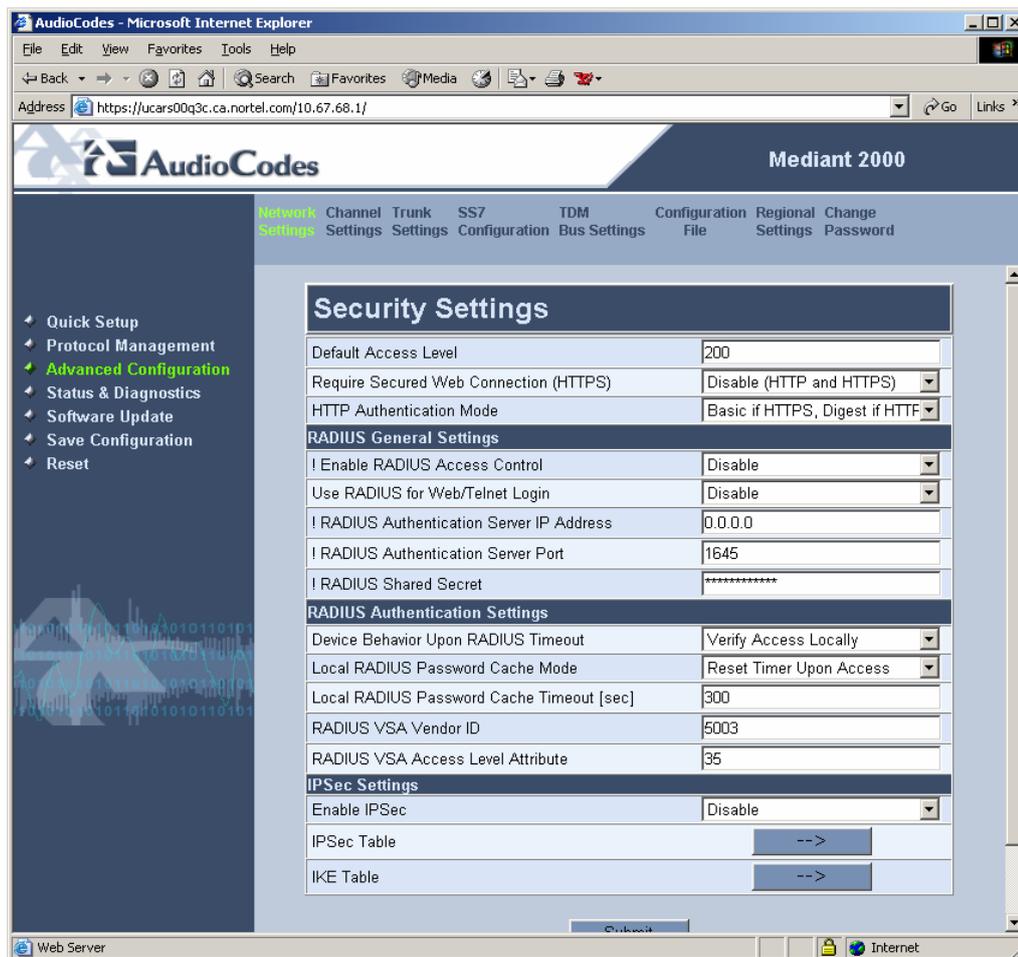
Figure 8-1 Security Settings

9 Updating *ini* Configuration Files

9.1 Sample Default *ini* File version SN09

This section contains a sample default *ini* file specified for version SN09 of the MG 3200 for use in Nortel H.248 GW applications.

```
;**************
;** Ini File **
;**************


;****************************************************************************
;** The parameters set up in this ini file allow the M2K to be used within
;** the Nortel SL100 and CS2K solutions.
;****************************************************************************


[BSP Params]


; Setting BOOTPRETRIES to 3 will configure the board to see a bootp response 3 times
; over the course of 6 seconds following a hard reset
BOOTPRETRIES = 3


; BOOTPDELAY is the amount of time the board will delay before sending bootp
BOOTPDELAY = 1


; TDMBUSCLOCKSOURCE selects the clock source on which the board synchronizes
; A value of 4 = PSTN Network
TDMBUSCLOCKSOURCE = 4


; INIFILEVERSION is the version of this default ini file
INIFILEVERSION = 14


; CallProgressTonesFilename is the name (and path) of the file containing the Call
; Progress Tones definition. The tones.dat file should be present in the same directory
; as the ini file in which it is defined when using bootp/tftp to download files to
; the M2K.
CALLPROGRESSTONESFILENAME = 'tones.dat'



[ControlProtocols Params]


; MGCPCompatibilityProfile controls profiling of various MEGACO features including
; T.38 and Bypass support and characteristics of servicechange request, ptime, and
; notify transaction requests.
MGCPCOMPATIBILITYPROFILE = 28


; ProvisionedCallAgentsPorts is the list of ports for the CallAgents.
PROVISIONEDCALLAGENTSPORTS = 2944, 2944, 2944, 2944, 2944
```

```
;MGControlProtocolType determines the protocol type to be used for the MG.
;MGControlProtocolType = 2 is the setting for MEGACO
MGCONTROLPROTOCOLTYPE = 2


[MEGACO Params]
; ProvisionedCallAgents should contain the IP address of the ACTIVE GWC (not the unit IP address)
ProvisionedCallAgents = 1.2.3.4


PhysTermNamePattern = 'E1/0*/*'
LogicalRTPTermPattern = 'E1RTP/*'
LogicalATMTermPattern = 'E1ATM/*'


; MegacoTrunkIDOffset is a logical integer that is added to the internal integer
; value for a respective trunk element.  This value helps to map the internal logical
; number of the framer to the physical numbering.  Internally, the M2K starts at 0
; logically. Nortel framers start numbering at 1.
MEGACOTRUNKIDOFFSET = 1



[PSTN Params]

;TDMBusPSTNAutoClockEnable enables or disables the auto fallback PSTN clock feature.
; When set to 1, fallback is enabled.
TDMBUSPSTNAUTOCLOCKENABLE = 1


; ISDNOutCallsBehavior is a bit field that determines behavior options, influencing
; how the ISDN Stack OUTGOING calls behave.  The value 16384 (0x4000) in this parameter
; enables reversed DLCI TEI support like in the RFC (see RFC3057 p.21 Figure 6).
; For Nortel interworking this parameter must be set to 16384 (15th bit in binary).
; If not the DLCI TEI representation will not be presented for interworking and the
; IUA interfaces will not align.
ISDNOUTCALLSBEHAVIOR = 16384


; Q931RelayMode set to 3 is used to port all Q931 (layer 3) messages via IUA handling
; up to the signaling element of the Gateway Controller rather than terminating the Q931
; protocol on the board itself
Q931RELAYMODE = 3



[Voice Engine Params]

; These parameters support the detection of COT tones within the DSP associated to the
; physical element within a context and report the detection back to the H248
; interworking control protocol stack. This is used for SS7 interworking support of
; continuity tones on the physical paths. COT support is supported for Transparent
; framer definitions when applied by use of the protocoltype definitions per framer.
; EnableContinuityTones enables (1) or disables (0) Continuity Test tone detection and
; generation according to the IUT-T Q.724 recommendation.
```

```
ENABLECONTINUITYTONES = 1



; DTMFTransportType set to transparent enables the M2K to negotiate for RFC2833

; dynamically (via parsing of the SDP data provided by the GWC embedded within

; the H248 messaging).  If the two sides *do not* agree, the unit will leave the

; DTMF digits within the bearer path and it will be passed to the distant RTP

; device within the codec that was established for the bearer path. If the SDP

; information *is negotiated*, then the dtmf detected digits will be removed from

; the bearer path and relayed to the remote RTP device by use of RFC2833 DTMF relay.

DTMFTRANSPORTTYPE = 2


; added 3/16/2004 – BrokentConnectionEventTimeOut – this parameter should be

; set to a high value (e.g. 2684354 = 3 days) in order to prevent the

; nt/netfail event generation

BROKENCONNECTIONEVENTTIMEOUT                                =                                2684354
```
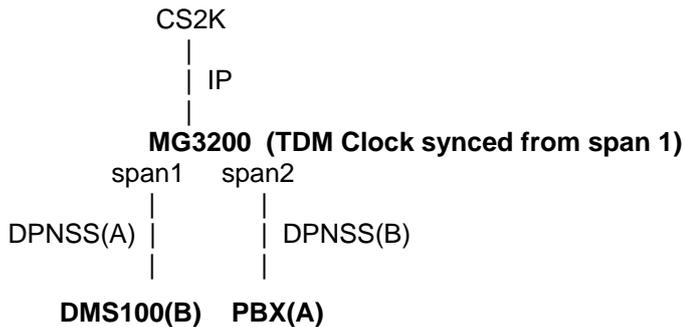
9.2   Sample Default *ini* File version SN09 (DPNSS)

This section contains a sample default ini file specified for version SN09 (DPNSS) of the MG 3200 for use in Nortel H.248 GW applications.

This default configures a MG3200 that connects to the PSTN (where TP board recovers it's TDM Clock Source from) on E1 port 1 and a PBX (where it generates that clock to) on E1 port 2.

In this configuration, the PSTN is a DMS100 but could be any BNTR[188] compatible interface.

```
                    CS2K
                      |
                      | IP
                      |
              MG3200  (TDM Clock synced from span 1)
            span1    span2
              |        |
  DPNSS(A) |        | DPNSS(B)
              |        |

       DMS100(B)   PBX(A)
```

```
;**************
;** Ini File **
;**************


;****************************************************************************
;** The parameters set up in this ini file allow the M2K to be used within

;** the Nortel SL100 and CS2K solutions (DPNSS).

;** Default values for a DPNSS MG3200 interconnecting to a PSTN and PBX.

;****************************************************************************


[BSP Params]


; Setting BOOTPRETRIES to 3 will configure the board to see a bootp response 3 times

; over the course of 6 seconds following a hard reset

BOOTPRETRIES = 3


; BOOTPDELAY is the amount of time the board will delay before sending bootp

BOOTPDELAY = 1


; PCMLAWSELECT selects the type of PCM companding law in input/output TDM bus

; A-law (1)

PCMLAWSELECT = 1


; TDMBUSCLOCKSOURCE selects the clock source on which the board synchronizes

; A value of 4 = PSTN Network

TDMBUSCLOCKSOURCE = 4


; For TDMBUSCLOCKSOURCE set to 'Network', TDMBUSLOCALREFERENCE tells the

; MG3200 which interface/span to recover TDM clocking from.
```

```
; (In this example, the MG3200 board receives clocking from a PSTN on span 0 (E1 port 1))
TDMBusLocalReference = 0


; INIFILEVERSION is the version of this default ini file
INIFILEVERSION = 14


; CallProgressTonesFilename is the name (and path) of the file containing the Call
; Progress Tones definition. The tones.dat file should be present in the same directory
; as the ini file in which it is defined when using bootp/tftp to download files to
; the MG3200.
; * A Prerecorded tones file is also required for tones that cannot be generated
; on the MG3200's hardware.
CALLPROGRESSTONESFILENAME = 'tones.dat'


[ControlProtocols Params]


; MGCPCompatibilityProfile controls profiling of various MEGACO features including
; T.38 and Bypass support and characteristics of servicechange request, ptime, and
; notify transaction requests.
MGCPCOMPATIBILITYPROFILE = 28


; ProvisionedCallAgentsPorts is the list of ports for the CallAgents.
PROVISIONEDCALLAGENTSPORTS = 2944, 2944, 2944, 2944, 2944


; MGControlProtocolType determines the protocol type to be used for the MG.
; MGControlProtocolType = 2 is the setting for MEGACO
MGCONTROLPROTOCOLTYPE = 2


[MEGACO Params]
; ProvisionedCallAgents should contain the IP address of the ACTIVE GWC (not the unit IP address)
ProvisionedCallAgents = 1.2.3.4


PhysTermNamePattern = 'E1/0*/*'
LogicalRTPTermPattern = 'E1RTP/*'
LogicalATMTermPattern = 'E1ATM/*'


; MegacoTrunkIDOffset is a logical integer that is added to the internal integer
; value for a respective trunk element. This value helps to map the internal logical
; number of the framer to the physical numbering. Internally, the MG3200 starts at 0
; logically. Nortel framers start numbering at 1.
MEGACOTRUNKIDOFFSET = 1


[PSTN Params]


; TDMBusPSTNAutoClockEnable enables or disables the auto fallback PSTN clock feature.
; When set to 1, fallback is enabled.
TDMBUSPSTNAUTOCLOCKENABLE = 1


; ProtocolType 37 defines the whole board to be E1 DUA.
```

```
ProtocolType = 37


; ClockMaster sets whether to generate or recover clock for a specific interface/span.

; (Without the _n suffix applies the setting to the whole board)

; (In this example, span 0 recovers clock and span 1 generates.)

ClockMaster_0 = 0

ClockMaster_1 = 1


; TerminationSide sets the DPNSS Endpoint designation, PBX-A (0) or PBX-B (1).

; Each side of a DPNSS interface must have a different PBX designation.

; ( Note: This is the same concept as PRI User/Network.

;    DPNSS uses the same parameter TerminationSide_x to designate which end of the E1 interface

;    the MG3200 is providing:

;       - DPNSS requires one side to be A, the other to be B.

;       - PRI requires one side to be User, the other to be Network.

; )

TerminationSide_0 = 0

TerminationSide_1 = 1


; FramingMethod for DPNSS is commonly "E1 Framing DDF" (a).

FramingMethod = a


; LineCode for DPNSS is commonly HDB3 (2)

LineCode = 2


; IUAInterfaceID_n sets the Integer Interface ID for that span.

; For a DPNSS interface, this must match with the PRI/DPNSS IID box in SESM and cannot be 0.

; For a Q931 interface, the PRI/DPNSS IID box in SESM must be 0 and the DTid value entered

; here. (shown on >mapci>pradch next to GWC number)

IUAInterfaceID_0 = 1

IUAInterfaceID_1 = 2


; DPNSSBehaviour is used to refine the behaviour of the DPNSS<>DUA interface.

; This must be the default 0.

DPNSSBehaviour = 0


[Voice Engine Params]


; These parameters support the detection of COT tones within the DSP associated to the

; physical element within a context and report the detection back to the H248

; interworking control protocol stack. This is used for SS7 interworking support of

; continuity tones on the physical paths. COT support is supported for Transparent

; framer definitions when applied by use of the protocoltype definitions per framer.

; EnableContinuityTones enables (1) or disables (0) Continuity Test tone detection and

; generation according to the IUT-T Q.724 recommendation.

ENABLECONTINUITYTONES = 1


; DTMFTransportType set to transparent enables the M2K to negotiate for RFC2833

; dynamically (via parsing of the SDP data provided by the GWC embedded within
```

```
; the H248 messaging). If the two sides *do not* agree, the unit will leave the
; DTMF digits within the bearer path and it will be passed to the distant RTP
; device within the codec that was established for the bearer path. If the SDP
; information *is negotiated*, then the dtmf detected digits will be removed from
; the bearer path and relayed to the remote RTP device by use of RFC2833 DTMF relay.
DTMFTRANSPORTTYPE = 2


; added 3/16/2004 - BrokentConnectionEventTimeOut - this parameter should be
; set to a high value (e.g. 2684354 = 3 days) in order to prevent the
; nt/netfail event generation
BROKENCONNECTIONEVENTTIMEOUT = 2684354
```
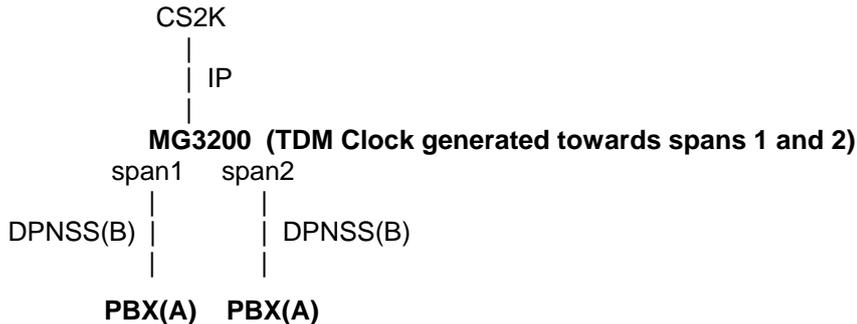
9.3   Sample Default ini File version SN09 (CPE DPNSS)

This section contains a sample default ini file specified for version SN09 (DPNSS) of the MG 3200 for use in Nortel H.248 GW applications.

This default configures a MG3200 that does not have a direct E1 interface to the PSTN (and so the TP board must use it's own internal TDM Clock to generate sync towards the PBX's).

All calls destined for the PSTN (assuming correct translations on CS2K and PBX) would transit as RTP over IP into the CS2K network.

```
                       CS2K
                        |
                        | IP
                        |
               MG3200  (TDM Clock generated towards spans 1 and 2)
             span1    span2
               |        |
    DPNSS(B) |          | DPNSS(B)
               |        |
           PBX(A)    PBX(A)
```

```
;**************
;** Ini File **
;**************


;***************************************************************************
;** The parameters set up in this ini file allow the M2K to be used within
;** the Nortel SL100 and CS2K solutions (DPNSS).
;** Default values for a DPNSS MG3200 interconnecting to PBX's.
;***************************************************************************


[BSP Params]


; Setting BOOTPRETRIES to 3 will configure the board to see a bootp response 3 times
; over the course of 6 seconds following a hard reset
BOOTPRETRIES = 3


; BOOTPDELAY is the amount of time the board will delay before sending bootp
BOOTPDELAY = 1


; PCMLAWSELECT selects the type of PCM companding law in input/output TDM bus
; A-law (1)
PCMLAWSELECT = 1


; TDMBUSCLOCKSOURCE selects the clock source on which the board synchronizes
; A value of 1 = Internal  (Default value)
TDMBUSCLOCKSOURCE = 1


; INIFILEVERSION is the version of this default ini file
INIFILEVERSION = 14
```

```
; CallProgressTonesFilename is the name (and path) of the file containing the Call
; Progress Tones definition. The tones.dat file should be present in the same directory
; as the ini file in which it is defined when using bootp/tftp to download files to
; the MG3200.
; * A Prerecorded tones file is also required for tones that cannot be generated
; on the MG3200's hardware.
CALLPROGRESSTONESFILENAME = 'tones.dat'


[ControlProtocols Params]


; MGCPCompatibilityProfile controls profiling of various MEGACO features including
; T.38 and Bypass support and characteristics of servicechange request, ptime, and
; notify transaction requests.
MGCPCOMPATIBILITYPROFILE = 28


; ProvisionedCallAgentsPorts is the list of ports for the CallAgents.
PROVISIONEDCALLAGENTSPORTS = 2944, 2944, 2944, 2944, 2944


; MGControlProtocolType determines the protocol type to be used for the MG.
; MGControlProtocolType = 2 is the setting for MEGACO
MGCONTROLPROTOCOLTYPE = 2


[MEGACO Params]
; ProvisionedCallAgents should contain the IP address of the ACTIVE GWC (not the unit IP address)
ProvisionedCallAgents = 1.2.3.4


PhysTermNamePattern = 'E1/0*/*'
LogicalRTPTermPattern = 'E1RTP/*'
LogicalATMTermPattern = 'E1ATM/*'


; MegacoTrunkIDOffset is a logical integer that is added to the internal integer
; value for a respective trunk element. This value helps to map the internal logical
; number of the framer to the physical numbering. Internally, the MG3200 starts at 0
; logically. Nortel framers start numbering at 1.
MEGACOTRUNKIDOFFSET = 1


[PSTN Params]


; TDMBusPSTNAutoClockEnable enables or disables the auto fallback PSTN clock feature.
; When set to 1, fallback is enabled.
TDMBUSPSTNAUTOCLOCKENABLE = 1


; ProtocolType 37 defines the whole board to be E1 DUA.
ProtocolType = 37


; ClockMaster sets whether to generate or recover clock for a specific interface/span.
; (Without the _n suffix applies the setting to the whole board)
; (In this example, all spans generate clock.)
```

```
ClockMaster = 1


; TerminationSide sets the DPNSS Endpoint designation, PBX-A (0) or PBX-B (1).

; Each side of a DPNSS interface must have a different PBX designation.

; ( Note: This is the same concept as PRI User/Network.

;    DPNSS uses the same parameter TerminationSide_x to designate which end of the E1 interface

;    the MG3200 is providing:

;        - DPNSS requires one side to be A, the other to be B.
;        - PRI requires one side to be User, the other to be Network.

; )

; (In this example, all spans are designated 'B' Network.)
TerminationSide = 1


; FramingMethod for DPNSS is commonly "E1 Framing DDF" (a).
FramingMethod = a


; LineCode for DPNSS is commonly HDB3 (2)
LineCode = 2


; IUAInterfaceID_n sets the Integer Interface ID for that span.

; For a DPNSS interface, this must match with the PRI/DPNSS IID box in SESM and cannot be 0.

; For a Q931 interface, the PRI/DPNSS IID box in SESM must be 0 and the DTid value entered

; here. (shown on >mapci>pradch next to GWC number)
IUAInterfaceID_0 = 1
IUAInterfaceID_1 = 2


; DPNSSBehaviour is used to refine the behaviour of the DPNSS<>DUA interface.
; This must be the default 0.
DPNSSBehaviour = 0


[Voice Engine Params]


; These parameters support the detection of COT tones within the DSP associated to the

; physical element within a context and report the detection back to the H248

; interworking control protocol stack. This is used for SS7 interworking support of

; continuity tones on the physical paths. COT support is supported for Transparent

; framer definitions when applied by use of the protocoltype definitions per framer.

; EnableContinuityTones enables (1) or disables (0) Continuity Test tone detection and

; generation according to the IUT-T Q.724 recommendation.
ENABLECONTINUITYTONES = 1


; DTMFTransportType set to transparent enables the M2K to negotiate for RFC2833

; dynamically (via parsing of the SDP data provided by the GWC embedded within

; the H248 messaging). If the two sides *do not* agree, the unit will leave the

; DTMF digits within the bearer path and it will be passed to the distant RTP

; device within the codec that was established for the bearer path. If the SDP

; information *is negotiated*, then the dtmf detected digits will be removed from

; the bearer path and relayed to the remote RTP device by use of RFC2833 DTMF relay.
DTMFTRANSPORTTYPE = 2
```

```
; added 3/16/2004 - BrokentConnectionEventTimeOut - this parameter should be

; set to a high value (e.g. 2684354 = 3 days) in order to prevent the

; nt/netfail event generation

BROKENCONNECTIONEVENTTIMEOUT = 2684354
```