



Ehangcom iSX4000 Universal Application Platform

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# HugeCap User Manual

Version 2.1.4

## Revision History

	<b>Date</b>	<b>Change</b>
VER 2.0	2009-2-10	Created this document
VER 2.1	2009-3-25	Added the description of some parameters and amended the description error of TsZZSigCfg
VER 2.1.1	2009-4-17	Added the description of some parameters and adjusted the description of multiple MSUServers
VER 2.1.2	2009-4-20	Amended the description error of the USED parameter
VER 2.1.3	2010-3-10	Adjusted several layouts
VER 2.1.4	2010-7-16	Amended some textual errors in the document

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# About This Manual

Welcome to this document. It is the HugeCap user manual. This software provides the signaling capture function for EHANGCOM ISX4000 universal application platform. The software-related purpose, intended audience, document description and relevant information are as follows:

## Purpose

This manual specially describes the installation, uninstallation, configuration and log analysis of HugeCap in the Win32, Solaris and CentOS linux platforms.

## Intended Audience

1. Distributors
2. System Integrators
3. Toolkit Developers
4. Independent Software Vendors(ISVs)
5. Value Added Resellers(VARs)
6. Original Equipment Manufactures(OEMs)

## How to Use This Manual

This manual is concomitant with the software installation. This document mainly includes the following sections:

- 1 *Application Environment*: This section describes the hardware and software environment of HugeCap.
- 2 *Win32 Platform*: This section specially describes the installation, running and uninstallation of HugeCap in the Win32 platform.
- 3 *Solaris Platform*: This section specially describes the installation, running and uninstallation of HugeCap in the Solaris platform.
- 4 *CentOS/RedHat RHEL linux Platform*: This section specially describes the installation, running and uninstallation of HugeCap in the *CentOS/RedHat RHEL Linux* platform.
- 5 *Configuration Description*: This section describes the configuration items of the configuration files required for HugeCap running.
- 6 *Log Description*: This section describes HugeCap running logs.

## Relevant Information

For relevant information of this manual, refer to the following documents:

1. *ISX4000 OAM User Manual*
2. *ISX4000 MC User Manual*
3. *ISX4000 CallSim User Manual*

# 1 Application Environment

## 1.1 Operating Environment

Operating system:

Win32 platform: Windows 2000 Professional/Server      Windows 2003 Server

Solaris platform: Solaris9

Linux platform: CentOS4.x/RHEL4.x

## 1.2 Hardware Requirements

### **Minimum configuration:**

CPU: Intel Core2 Duo E7300 or above

Memory: 1GMB

Display: Standard VGA 256 color display mode or above

Hard disk: SATAII, 32M cache, 7200 RPM, more than 10GB space

Network card: 100M network card

Other devices: Not required

### **Recommend Configuration:**

CPU: Intel Core 2 Quad Q6600 or above

Memory: More than 2GB

Hard disk: Ultra SCSI 320, 32M cache, 10000 RPM, more than 20GB space

Display: SVGA 16 bit color display mode or above

Network card: 1000M network card

Other devices: refer to "Minimum configuration"

## 2 Win32 Platform

### 2.1 Installation

#### 2.1.1 Installing the HugeCap Software

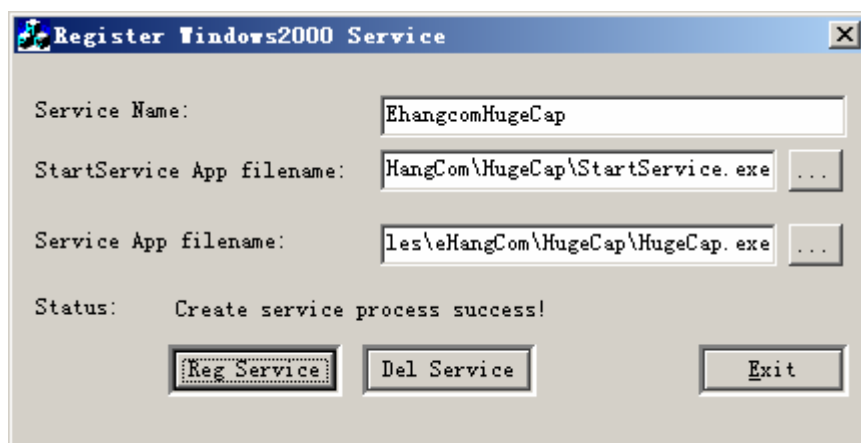
For details, refer to the *ISX4000 Software Installation Manual*.

#### 2.1.2 Installing the Windows2000 service

There are two methods for installation of the HugeCap service:

1. Select installing the **EhangcomHugeCap** service during the installation of the platform software of this system.
2. Install the service by running the HugeCap registration program RegService (“Start Menu\Program\Ehangcom\HugeCap\RegService”).

The GUI is shown in the following figure:



*Note: EhangcomHugeCap is the HugeCap service name.*

*C:\Program Files\Ehangcom\HugeCap\StartService.exe is the file that start the service (provided in the installation program).*

*C:\Program Files\Ehangcom\HugeCap\HugeCap.exe is the HugeCap file name.*

Input correct parameters “Service Name”, “StartService App filename” and “Service App filename”. Click “Start Service” to install the service. If parameters are correct, a prompt window for service installation success is displayed, as shown in the following figure.





## 2.2 Running

### 2.2.1 Start the Service

Two methods are available for activating the service after the service is installed.

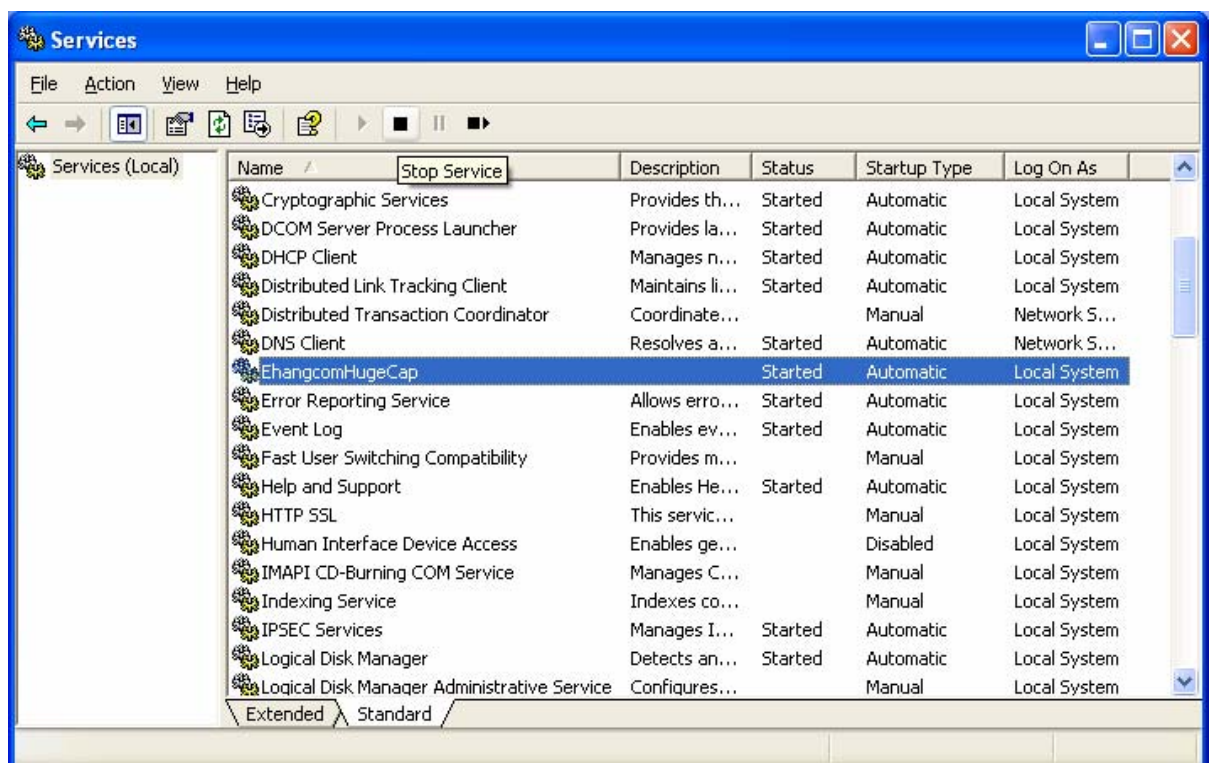
- 1 Start the service by directly selecting the service named ***EhangcomHugeCap*** in the Windows2000/2003 services.
- 2 Restart the computer.

## 2.3 Uninstallation

Before uninstalling this software, refer to the sections 2.3.1 and 2.3.2 to thoroughly delete relevant services. For other uninstallation details, refer to the *ISX4000 Software Installation Manual*.

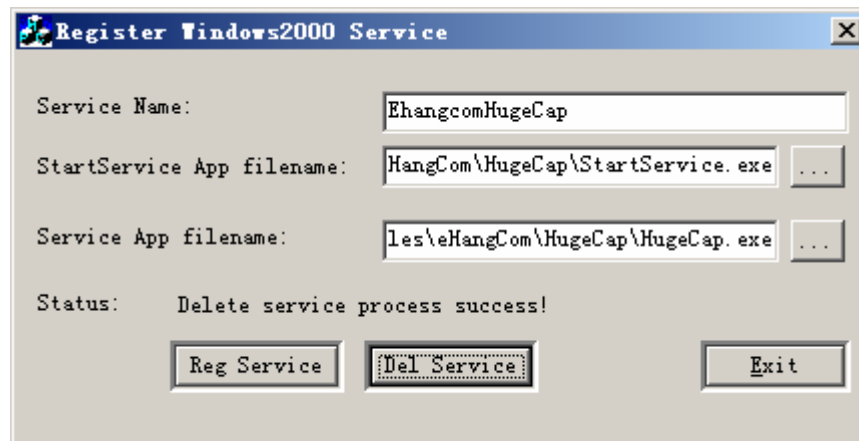
### 2.3.1 Stop the Service

Run the “Service” management tool of windows to deactivate the ***EhangcomHugeCap*** service, as shown in the following figure:



### 2.3.2 Deleting the Service

Run the “RegService” program, input the parameters “Service Name” and “StartService App filename”, and click “Del Service” to delete the service, as shown in the following figure:



The service is successfully deleted, and the following figure is displayed:



### 2.3.3 Uninstalling HugeCap

Refer to the *ISX4000 Software Installation Manual*.

## 3 Solaris Platform

### 3.1 Installation

#### 3.1.1 Installing the HugeCap Software

Use the following commands to install this software

1 Default installation:

```
pkgadd -d ehangcom-hugecap-1.0.0.1-sol9-intel-local  
ehangcom-hugecap-1.0.0.1-sol9-intel-local: Installation package name that is changed  
with the improvement of the software and is subject to the actual name.
```

2 Install the software in a specific directory:

```
pkgadd -d ehangcom-hugecap-1.0.0.1-sol9-intel-local -R root_path  
root_path: Specify a directory where the software is installed.
```

Restart the computer after the installation, and the program automatically runs.

Attention:

Users who install this software must have the root user authority.

### 3.2 Uninstallation

#### 3.2.1 Stop HugeCap

Run the following command to stop HugeCap:

```
pkill hugecap.out
```

#### 3.2.2 Uninstalling HugeCap

1. For the default installation, run the following command to uninstall this software:

```
pkgrm ehangcom-hugecap
```

2. For installation in a specific directory, run the following command to uninstall this

software:

```
pkgrm -R root_path ehangcom-hugecap
```

root\_path: Specify an installation directory.

Attention:

Users who install this software must have the root user authority.

## **4 CentOS/Redhat RHEL linux Platform**

Refer to the *ISX4000 Software Installation Manual*.

## 5 Configuration Description

This system is a multifunctional signaling capture system and supports the following signaling protocol: PRI, SS7 and FR (frame relay). In addition, it supports capture of 64k signaling links and N\*64K (including 2M) high-speed signaling links.

During the system startup, the application read the configuration files to obtain the global parameters and signaling capture items and use them to start the signaling capture..

The file *config.ini* is the configuration file and in the same directory as this software.

Configuration contents of configuration files may be manually changed. They may also be configured in a visualized manner by using the HugeCapCfger software. For the visualized configuration method, refer to the *ISX4000 OAM User Manual and . ISX4000 HugeCapCfger User Manual*

Configuration files include the following configuration items: global parameters, MC configuration, PRD configuration, MSU Server configuration and node configuration. The configuration contents are described as follows:

### 5.1 Global Parameters

Global parameters are saved in [Global] Session. The parameter items are described in the following sections.

#### 5.1.1 Log2Stdout Parameters

Parameter name: Log2Stdout

Description: Whether to output debugging information to the stdout.

1: Output, 0: No output. The default is 0.

Example:

Log2Stdout = 0 ; No debugging information is output to the stdout.

Log2Stdout = 1 ; Debugging information is output to the stdout.

#### 5.1.2 Log2File Parameter

Parameter name: Log2File

Description: Whether to output to log files.

1: Output, 0: No output. The default is 0.

Example:

Log2File = 1 ; Debugging information is output to log files.

Log2File = 0 ; No debugging information is output to log files.

#### 5.1.3 LogDbgLvl Parameter

Parameter name: LogDbgLvl

Description: Debugging level of system output logs : <=LogDbgLvl logs are written to log files and stdout.

Level 0: Fatal error

Level 1: Alarm

## Level 2: Information

Example:

LogDbgLvl = 0 ; Fatal error information is output to stdout and log files.

LogDbgLvl = 1 ; Fatal error information and alarm information are output to stdout and log files.

LogDbgLvl = 2 ; Fatal error information, alarm information and ordinary information are output to stdout and log files.

### 5.1.4 LogMSUDetail Parameter

Parameter name: LogMSUDetail

Description: This parameter is the debugging option for the functional test and controls whether the signaling messages sent to MsuServer will be write to log files. This option is normally not used, otherwise the application efficiency is low because of writing log files.  
0: No output 1: Output in hexadecimal format 2: Decoding output

**Attention:**

Signaling messages that send to MsuServer are level 2 debugging information. The LogDbgLvl parameter must be set to more than or equal to 2 to correctly output logs.

This option is normally not used, otherwise the application efficiency is low because of writing log files.

Example:

LogMSUDetail = 0 ; No MSU messages are output to log files.

### 5.1.5 LogFileLifetime Parameter

Parameter name: LogFileLifetime

Description: Log file reserving time in days.

Default: 15 days

Example:

LogFileLifetime = 15 ; log files within the last 15 days are reserved and the others are automatically deleted.

### 5.1.6 LogPath Parameter

Parameter name: LogPath

Description: Log files reserving path. If the parameter is null, it indicates that the path is the directory where the application is located.

Real log files are saved in %LogPath%/LogYYYY directory.

Default: Directory where the application is located

Example:

LogPath = ; if the parameter is null, it indicates that the path is the directory where the application is located.

### 5.1.7 MsuPath Parameter

Parameter name: MsuPath

Description: Path of MSU data files. If the parameter is null, it indicates that the path is the directory where the application is located.

MSU messages that fail to be sent are saved in binary file and in time sequence. These files are stored in %MsuPath%/MsuYYYY directory.

Default: Directory where the application is located

Example:

MsuPath = ; if the parameter is null, it indicates that the path is the directory where the application is located.

### 5.1.8 PcmPath Parameter

Parameter name: PcmPath

Description: Path of PCM data files. If the parameter is null, it indicates that the path is the directory where the application is located.

Raw PCM data is saved in binary. File in %PcmPath%/PcmYYYY directory.

Default: Directory where the application is located

**Attention:**

This parameter is used for the test mode only. The capture type CapType parameter must be set to 3 to correctly use this function.

Example:

PcmPath = ; If the parameter is null, it indicates that the path is the directory where the application is located.

### 5.1.9 MinMsuLen Parameter

Parameter name: MinMsuLen

Description: The shortest valid MSU data length. If the length of the MSU data is less than this parameter, the data will be discarded.

Default: 0. It indicates that no filtering conditions are set.

**Attention:**

This parameter is used only as needed, otherwise data packets will be lost.

Example:

MinMsuLen = 0 ; it indicates that no filtering conditions are set.

### 5.1.10 LogStatisticPeriod Parameter

Parameter name: LogStatisticPeriod

Description: Period interval for outputting statistical data to logs in seconds.

0 indicates no output; more than 0 indicates the period interval in seconds.

Default: 0. It indicates that no statistical data is output to log files.

**Attention:**

This parameter is used only when the total number of received and sent data is checked. It shall be set to 0 in normal use, otherwise many logs will be generated, affecting the

efficiency of the program.

Example:

LogStatisticPeriod = 0 ; No statistical data is output to log files.

## 5.2 MC Parameters

MC-related parameters are saved in [MC] Session. The parameter items are described in the following sections.

### 5.2.1 IP Parameter

Parameter name: IP

Description: MC IP address.

Default: 127.0.0.1

Example:

IP = 127.0.0.1

### 5.2.2 PORT Parameter

Parameter name: PORT

Description: MC listening port.

Default: 9001

Example:

PORT = 9001

### 5.2.3 KEEPALIVE Parameter

Parameter name: KEEPALIVE

Description: IsxApi and MC connection check period.

Default: 2

Example:

KEEPALIVE = 2

## 5.3 PRD Parameters

PRD-related parameters are saved in [PRD] Session. The parameter items are described in the following sections.

### 5.3.1 PRDNO Parameter

Parameter name: PRDNO

Description: PRD node number used in this system

Valid value: 0-32.

Default: 0



**Attention:**

This parameter is a key parameter. Please use the OAM software to check whether PRD has been correctly configured. For more information, refer to the *ISX4000 OAM User Manual*.

Example:

PRDNO = 0

## 5.4 MSUSERVER Parameters

The signaling capture server (Msu Server) related parameters are saved in [MSUSERVER] Session. The parameter items are described in the following sections.

This system may be configured with multiple MsuServer informations to do the load balance, i.e. the system averagely distributes loads to each MsuServer by using trunk as the unit; if a MsuServer disconnected, the system automatically sends the load of this MsuServer to the MsuServer that has the minimum MsuServer number.

### 5.4.1 H2N Parameter

Parameter name: H2N

Description: Byte order setting of the network message between the hugecap and the signaling capture server (MsuServer)

0 local order; 1 network order

Default: 0

**Attention:**

This parameter must be consistent with the setting of MsuServer, otherwise data explanation is not correct.

Example:

H2N = 0

### 5.4.2 MAX\_MSU\_SERVER\_NUM Parameter

Parameter name: MAX\_MSU\_SERVER\_NUM

Description: Total number of signaling capture servers. The maximum value is 8.

Example:

MAX\_MSU\_SERVER\_NUM = 2

### 5.4.3 MSUSERVERxx Parameter

Parameter name: MSUSERVER00 - MSUSERVER07

Description: Signaling capture server parameter. The value of this parameter is a complex parameter in the following format:

MSUSERVERxx = STATUS,IP:PORT

Where, xx: Server number in the range of 00-07

STATUS: Whether this signaling capture server is used. Value meaning: -1 unavailable, 0 deactive, 1 active

IP: IP address information of the signaling capture server

PORT: Listening port of the signaling capture server

**Attention:**

The setting is valid only when STATUS is set to 1. If it is set to other values, the HugeCap will not do the network connection with this IP.

Example:

MSUSERVER00 = 1,127.0.0.1:4567

MSUSERVER00 = 1,10.10.5.194:4567

## 5.5 NODEx Parameters

The main hardware resources used by this system are trunk interfaces and DSP signaling capture channels. These resource parameters are saved in [NODEx] Session. Where, x in NODEx is the switch node number in the range of 0-15. A node corresponds to a Session.

The parameter items of a [NODEx] Session are described in the following sections.

### 5.5.1 USED Parameter

Parameter name: USED

Description: The parameter specifies whether to use this node.

1 used; 0 unused.

**Attention:**

This parameter must be consistent with the setting of MsuServer, otherwise data explanation is incorrect.

Example:

USED = 1

### 5.5.2 SPANXXYY Parameter

Parameter name: SPAN0000 - SPAN1507

Description: This parameter specifies trunk interface resources that used. This parameter is a complex parameter. A trunk corresponds to a parameter. The parameter is described in the similar BNF normal form.

Parameter format:

SPANXXYY = N64KMode;SpanSigCfg;Ts1Cfg;Ts2Cfg;...TsZZSigCfg;...Ts31SigCfg

Where, SpanSigCfg and TsZZSigCfg are also complex parameters.

XX: Trunk board numbers 00-15

YY: Trunk numbers 00-07

N64KMode: Specifies whether signaling links are 64k signaling links or N\*64k signaling links

0: Single 64K mode, 1: N\*64K mode

SpanSigCfg: Signaling setting in the N\*64K mode. There is no explanation in the 64k mode.

Format: CapType,StackLevel,PcLen.

CapType: Captured signaling type

- 160: PRI signaling data
- 161: SS7 Signaling data
- 162: FR (frame relay) signaling data
- 3: **PCM raw data. These data are written to PcmYYYY directory and not forwarded to MsuServer. This option is used for debugging and pair-testing. In addition, only one 64k mode signaling capture or one N\*64K signaling capture can be set. It cannot be set in normal use.**

StackLevel: Protocol filtering layer definition that is relevant to the capture type.

CapType is 160: PRI signaling data. Range: 0 Q.921 data; 1 Q.931 data.

CapType is 161: SS7 signaling packet capture data. Range: 0 MTP2 data; 1 MTP3 data; 2 MSU data.

CapType is 162: FR (frame relay) signaling data. Range: 0 Q.922 data; 1 I frame data

PcLen: SS7 point code length. This parameter is valid only when the signaling capture type is SS7. There is no explanation for other types.

- 0: 14bit DPC
- 1: 16Bit DPC
- 2: 24bit DPC

TsZZSigCfg: Time slot signaling setting. A time slot corresponds to a setting. They are separated by “;”.

In the single 64K mode, format: TsId, CapType, StackLevel, PcLen

In the N\*64K mode, format: TsId (only the time slot number included)

TsId range: 1-31.

;configuration example 1: 64k mode; SS7 signaling packet capture data, MTP3 data, 24Bit DPC; 16 time slot, SS7 signaling packet capture data, MTP3 data, 24Bit DPC

SPAN0005 = 0;161,1,2;**16,161,1,2**

SPAN0005DSPRES = 3;32;1

;configuration example 2: 64k mode; SS7 signaling packet capture data, MSU data, 24Bit DPC; time slot 16, SS7 signaling packet capture data, MSU data, 24Bit DPC

SPAN0005 = 0;161,2,2;16,161,2,2

SPAN0005DSPRES = 3;32;1

;configuration example 3: N64K mode; SS7 signaling packet capture data, MTP2 data, 24Bit DPC; 1;...time slot 31

SPAN0104 = 1;161,0,2;1;2;3;4;5;6;7;8;9;10;11;12;13;14;15;16;17;18;19;20;21;22;23;24;25;26;27;28;29;30;31

SPAN0104DSPRES = 8;1;31

;configuration example 4: N64K mode; SS7 signaling packet capture data, MTP3 data, 24Bit DPC; 1;...time slot 31

SPAN0104 = 1;161,1,2;1;2;3;4;5;6;7;8;9;10;11;12;13;14;15;16;17;18;19;20;21;22;23;24;25;26;27;28;29;30;31

SPAN0104DSPRES = 8;1;31

;configuration example 5: N64K mode; SS7 signaling packet capture data, MSU data, 24Bit DPC; 1;...time slot 31

SPAN0104 = 1;16;1,2,2;1;2;3;4;5;6;7;8;9;10;11;12;13;14;15;16;17;18;19;20;21;22;23;24;25;26;27;28;29;30;31

SPAN0104DSPRES = 8;1;31

;configuration example 6: debugging mode, N64K mode, recording Pcm raw data

SPAN0104 = 1;3,0,2;1;2;3;4;5;6;7;8;9;10;11;12;13;14;15;16;17;18;19;20;21;22;23;24;25;26;27;28;29;30;31

SPAN0104DSPRES = 8;1;31

;configuration example 7: debugging mode, 64K mode, recording Pcm raw data

SPAN0000 = 1;3,0,2;1,3,0,2

SPAN0000DSPRES = 0;1;31

### 5.5.3 SPANXXYYDSPRES Parameter

Parameter name: SPAN0000DSPRES - SPAN1507DSPRES

Description: This parameter specifies the DSP capture channel resource corresponding to the SPANXXYY trunk. If SPANXXYY is null, there is no explanation. This parameter is a complex parameter.

Parameter format:

SPANXXYYDSPRES = DspBrdNo;DspStartChanNo;TotalDspChanNum

DspBrdNo: Dsp resource board number in the range of 0-15

DspStartChanNo: Start channel number in the range of 0-127

TotalDspChanNum: Total number of used Dsp channels

#### Attention:

A DSP channel corresponds to a trunk time slot. If the total number of DSP channels is inadequate, configuration errors may occur.

DSP channel distribution constraints and limitations:

- An E1 has only one N64K, and some trunk time slots can be deleted from trunk time slots 1-31.
- DSP resources compose a group by using 32 channels as a unit. All trunk time slots of an N64k must be distributed in the same group.

Configuration example 1: DSP daughter board 0; start channel 1; 31 channels in total.

SPAN0000DSPRES = 0;1;31

For more example, refer to the section 5.5.2.

## 6 Log Description

During the system running, system running logs are output as needed. HugeCap logs are described as follows:

### 6.1 Log File Saving Rule

A folder is generated in LogYYYY format every year. All log files for this year are saved in this directory. This directory is saved in the directory specified by the LogPath parameter in the configuration files. It is saved in the HugeCap directory by default.

To save space, HugeCap saves only those logs that are generated in the last 15 days. If any adjustment is required, modify the LogFileLifetime parameter in the configuration files.

### 6.2 Log File Naming Rule

LogYYMMDD\_HHmmSS\_TTTTTT.txt: It indicates that this log file is created in YY (year) MM (month) DD (day) HH (hour) MM (minute) SS (second) TTTTTT (microsecond). For a log file, up to 1,000,000 lines are saved. In case of excess, a new log file is automatically generated for saving it.

### 6.3 Log Level

Currently, logs are divided into 3 levels:

Level 0: Fatal error

Level 1: Alarm

Level 2: Information

### 6.4 Log Output Format

The following sections explain the output formats of log contents. These formats may be changed with the upgrade of the software.

#### 6.4.1 Non-MSU Module

&X [HH:mm:SS.TTTTTT][ModName] LogDetail

Explanation:

&X: Log level.

[HH:mm:SS.TTTTTT]: Log output moment to the accuracy of ms.

[ModName]: Log output module name. Module names include MAIN, ISX and PRD.

LogDetail: Log details.

#### 6.4.2 Module of MSU Type

&X [HH:mm:SS.TTTTTT][ModName][ IP=IpAddr Port=PortNum SNO=X] LogDetail

Explanation:

[ModName]: Log output module name. This type of module names includes MSU.

[Ip:Por SNO=X]: Module IP address IpAddr and port PortNum. This module is the X<sup>th</sup> example of this type of modules. The explanation on the other parts of this format is the same as that of “Non-MSU Module”.