



# ITU Integrated SS7 ISUP, V5.1(2), Release Notes

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# Preface

The *ITU Integrated SS7 ISUP, V5.1(2), Release Notes* provide important information about Version 5.1(2) of ITU Integrated SS7 ISUP software. This information includes

- A list of the enhancements and problems corrected since Version 5.0 FSR00.
- A description of the system requirements for V5.1(2).
- A list of special considerations you should be aware of.
- A list of known design constraints.
- A list of known functional constraints and work arounds.

For information on how to install and use the ITU Integrated SS7 product, refer to the *ITU Integrated SS7, V5.1, System Supplement* (PN 78-10332-01).

These release notes are intended for programmers familiar with VCO Systems, SS7 concepts, UNIX, and Ethernet.

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- Modem: From North America, 408 526-8070; from Europe, 33 1 6446 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

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# Section 1

# CONTENTS OF THE RELEASE

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## 1.1 INTRODUCTION

ITU Integrated SS7 ISUP, Version 5.1(2), is an enhancement to the existing SS7 software. This section describes the enhancements and problems corrected since ITU Integrated SS7 ISUP, Version V5.0 FSR00.

*NOTE: Change bars reflect changes since ITU Integrated SS7 ISUP, Version 5.1 FSR01.*

New features and enhancements in ITU Integrated SS7, Version 5.1(2), include:

- Support for Germany and Switzerland variants
- Support for Italy variant
- Support for Finland variant
- Support for Australia variant
- Support for Spain variant
- Four New CktInt.cfg feature flags
- Two new parameters for CktInt to support outbound COT
- New isup\_console feature
- Support of more than 15 parameters for outgoing SS7 messages
- Support for multiple SPs within an SS7 stack

This release complies with the ITU standards listed in Table 1.1.

**Table 1.1: ITU Standards Supported by V5.1(2)**

SS7 Layer	Standard
MTP-2	Q.701-Q.703, 1992
MTP-3	Q.704-Q.707, 1992
ISUP	Q.761-Q.764, 1992

*NOTE: The country variants of Integrated SS7 ISUP, V5.1(2), may not support all specifications for the standards listed in Table 1.1. In some cases, additional messages are required. The differences for each supported country are described in Appendix F of the ITU Integrated SS7, V5.1, System Supplement (PN 78-10332-01).*

## 1.2 INSTALLATION

**Prior to running the new software, you must complete the following upgrade steps:**

*NOTE: The default value of the CRGOFF bit in the ISUP office information has changed. This may affect your current configuration files when you upgrade. Formerly, the bit default was 0 (OFF). Now, the bit default is 1 (ON). Please add the **MODIFY-ISUPOFFINFO** line to your ISUP configuration files if you need this value set to off.*

1. **If you want to use the multi-SP feature, you must first purchase and install additional EBS SS7 software licenses.** Then, follow the directions below:
  - Bring down **both** the active and standby sides of your integrated SS7 system, as described in *Section 5.8 of the ITU Integrated SS7, V5.1, System Supplement* (PN 78-10332-01).
  - Do a fresh SS7 software installation, including creating new configuration files, as described in *Section 4 of the ITU Integrated SS7, V5.1, System Supplement*.
2. If you want to run in single-SP mode, follow the upgrade procedures described in *Appendix D of the ITU Integrated SS7, V5.1, System Supplement* (PN 78-10332-01).

***NOTE: If you decide to change to multi-SP mode at a later date, you must purchase additional EBS SS7 software licenses and follow step 1.***

## 1.3 ENHANCEMENTS

### 1.3.1 Support for Germany and Switzerland Variants

Cktint now supports the German and Swiss variants of ITU. There are no variant-specific messages for either country. One parameter, "Subscriber Priority Class," was added for Germany.

You must include the following line in your isup mml configuration to run either variant:

```
MODIFY-ISUPCONF:CFGNAME=CF0,VARIANT=GENERIC,MNTIND=ON;
```

### 1.3.2 Support for Italy Variant

Cktint now supports the Italian variant of ITU.

You must include the following line in your isup mml configuration to run this variant:

```
MODIFY-ISUPCONF:CFGNAME=CF0,VARIANT=ITALY,MNTIND=ON;
```

Italy specific messages added	Call Offering Message (COM) Charge Information (CRG) Identification Request (IDR) Identification Response (IRS)
-------------------------------	--



<p>Unsupported messages</p>	<p>Circuit Group Query (CQM)            Circuit Group Query Response (CQR)            Confusion (CFN)            Facility (FAC)            Forward Transfer (FOT)            Information (INF)            Information Request (INR)            Network Resource Management (NRM)            Pass Along (PAM)            Segmentation (SGM)            Unequipped CIC (UCIC)            User-to-User Information (USR)</p>
<p>Italy specific parameters added</p>	<p>Charge Band (CBND)            Charge Band Request (CBR)            Charge Units Indicator (CUI)            Crank Back Indicator (CRBI)            Incoming Trunk Identity (INTRI)</p>

## Enhancements

Unsupported parameters	Automatic Congestion Level (ACL) Call Diversion Information (CDUI) Call History Information (CHI) Call Reference (CRF) Connection Request (CONR) Echo Control Information (ECI) Generic Digits (GND) Generic Notification (GNNO) Generic Number (GNNU) Generic Reference (GNR) Information Indicators (INI) Information Request Indicators (INRI) Location Number (LON) Message Compatibility Information (MCOI) MLPP Precedence (MLPP) Network Specific Facilities (NSF) Original Called Number (OCDN) Origination ISC Point Code (OISC) Parameter Compatibility Information (PCI) Propagation Delay Counter (PDC) Redirecting Number (RDTG) Redirection Number (REDN) Redirection Number Restriction (RNR) Remote Operations (ROP) Service Activation (SAC) Transit Network Selection (XNS) Transmission Medium Requirement Prime (XMRP) Transmission Medium Used (XMU) User Service Information Prime (USIP) User Teleservice Information (UTI)
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### 1.3.3 Support for Finland Variant

Cktint now supports the Finland variant of ITU.

You must include the following line in your isup mml configuration to run this variant:

```
MODIFY-ISUPCONF:CFGNAME=CF0,VARIANT=FINLAND,MNTIND=ON;
```

Finland specific messages added	Charge Acknowledge (CHMA) Charge (CHM) Metering Pulse (MPM)
Unsupported messages	Charge Information (CRG) Continuity (COT) Continuity Check Request (CCR) Forward Transfer (FOT) Identification Request (IDR) Identification Response (IRS) Loopback Acknowledgment (LPA) Pass Along Message (PAM)
Finland specific parameters added	Cancellor SPC (CSPC) CHG Result (CRES) C-number (CNUM) Identity of the Incoming Trunk and Transit Exchange (ITC) Number of Metering Pulses (NOP) One-Time Charge (OTC) Tariff Type (TAR) Time Tariff (TTAR) Volume Tariff (VTAR)
Unsupported parameters	Continuity Indicators (COTI) Free Phone Indicators (FPI) Generic Reference (GNR) Hop Counter (HOP) MCID Request Indicator (MRQ) MCID Response Indicator (MRS)

Unsupported parameters (cont.)	MLPP Precedence (MLPP) Origination ISC Point Code (OISC) Service Activation (SAC)
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### 1.3.4 Support for Australia Variant

Cktint now supports the Australian variant of ITU. Australia's version of ISUP is referred to as Interconnect ISUP.

When calculating the circuit identification code (CIC) in your isup mml configuration, **the GRPID and ITU Circuit ID cannot equal 0 for Australia. Valid values for Australia GRPIDs are decimal, 1 through 127. Each GRPID must be unique. Valid values for Australia ITU Circuit IDs can equal 1 to 31.**

You must include the following line in your isup mml configuration to run this variant:

```
MODIFY-ISUPCONF:CFGNAME=CF0,VARIANT=AUSTRALIA,MNTIND=ON;
```

Unsupported messages	Call Modification Complete (CMC) Call Modification Request (CMR) Call Modification Reject (CMRJ) Charge Information (CRG) Circuit Group Query (CQM) Circuit Group Query Response (CQR) Continuity (COT) Continuity Check Request (CCR) Delayed Release (DRS) Facility Accepted (FAA) Facility Request (FAR) Forward Transfer (FOT) Facility Reject (FRJ) Identification Request (IDR) Identification Response (IRS) Information Message (INF) Information Request (INR) Loopback Acknowledgment (LPA)
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Unsupported messages (cont.)	<p>Network Resource Management (NLM)</p> <p>Overload Message (OLM)</p> <p>Pass Along Message (PAM)</p> <p>Segmentation Message (SGM)</p> <p>Unidentified Circuit Identification (UCIC)</p> <p>User-to-User Information (USR)</p>
Unsupported parameters	<p>Automatic Delivery Information (ADI)</p> <p>Call Diversion Information (CDUI)</p> <p>Call History Information (CHI)</p> <p>Call Modification Indicators (CMI)</p> <p>Call Reference (CRF)</p> <p>Circuit State Indicator (CTI)</p> <p>Closed User Group Interlock Code (CUGC)</p> <p>Connected Number (CONN)</p> <p>Connection Request (CONR)</p> <p>Continuity Indicators (COTI)</p> <p>Echo Control Information (ECI)</p> <p>Facility Indicators (FCI)</p> <p>Free Phone Indicators (FPI)</p> <p>Generic Digits (GND)</p> <p>Generic Notification (GNNO)</p> <p>Generic Number (GNNU)</p> <p>Generic Reference (GNR)</p> <p>Hop Counter (HOP)</p> <p>Information Indicators (INI)</p> <p>Information Request Indicators (INRI)</p> <p>Location Number (LON)</p> <p>MCID Request Indicator (MRQ)</p> <p>MCID Response Indicator (MRS)</p> <p>MLPP Precedence (MLPP)</p> <p>Network Specific Facilities (NSF)</p>

Unsupported parameters (cont.)	Origination ISC Point Code (OISC) Propagation Delay Counter (PDC) Redirection Number (REDN) Redirection Number Restriction (RNR) Remote Operations (ROP) Service Activation (SAC) Signalling Point Code (SPC) Transit Network Selection (XNS) Transmission Medium Requirement Prime (XMRP) Transmission Medium Used (XMU) User Service Information Prime (USIP) User Teleservice Information (UTI)
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### 1.3.5 Support for Spain Variant

Cktint now supports the Spain variant of ITU.

You must include the following line in your isup mml configuration to run this variant:

```
MODIFY-ISUPCONF:CFGNAME=CF0,VARIANT=SPAIN,MNTIND=ON;
```

Spain specific messages added	Charging (CHI) Malicious Call (MAL)
Spain specific parameters added	Tariff (TFA) Diversion Information (DIVI) Notification Type (NOT) Virtual Private Network Code (VPNC)

### 1.3.6 Four New CktInt.cfg Feature Flags

There are four new feature flags for the CktInt.cfg file:

- **-FEATURE\_FLAG10** — Suppresses protocol violation messages from the log file.
- **-FEATURE\_FLAG11** — Ignores the impulse rule number in ckt\_ss7\_to\_sds file.

- **-FEATURE\_FLAG12** — When a \$70 command gets rejected with "Invalid Class of Service," kctint releases a call, if one exists, and send an \$EA REL report to the host and a \$40 on-hook command to the VCO.
- **-FEATURE\_FLAG13** — Disables kctint from sending automatic RLCs when a REL message is received from the network. Instead, the host must send the RLC. *Will not work if the incoming and outgoing circuits are associated in the \$49 command.*

### 1.3.7 Two New Parameters for CktInt to Support Outbound COT

CktInt.cfg is enhanced with two new parameters to support outbound COT:

- **-OUT\_COT\_ORULErule**, where **rule** is the outpulse rule you set up for COT
- **-OUT\_COT\_HZhz**, where **hz** is either 2010 or 1780 hertz

To use outbound COT messages, add these two parameters to the end of your CktInt.cfg file and set up the following outpulse rule and supervision template:

Outpulse Rule:

```
TIME SUP 5
FINAL SUP #
```

Supervision Template #:

```
TIME      OK
ISUP Tone OKREP
```

If **-OUT\_COT\_ORULErule** and **-OUT\_COT\_HZhz** are not configured in the CktInt.cfg file, the following errors will be printed:

```
<CKTINT: CktInt ERROR PID:12318 Wed Jun 18 10:54:06 1997
**ERROR Outbound COT frequency not set, using 2010 Hz
<CKTINT: CktInt ERROR PID:12318 Wed Jun 18 10:54:06 1997
**ERROR Outbound COT outpulse rule not set, using orule 2
```

*NOTE: The Australia variant does not support outbound COT.*

### 1.3.8 New isup\_console Feature

**Stop (k)** — Stops a specified port from repeatedly sending a maintenance message (RSC, BLO, UBL, GRS, CGB or CGU) when it does not receive an appropriate network acknowledgment. Forces the circuit state to Active Idle.

The **isup\_console** program is located in the **~/sys/CktIntAnEnv (\$XNV)** directory. For detailed information on the **isup\_console**, see *Section 5.6* in the *ITU Integrated SS7, V5.1, System Supplement*.

### 1.3.9 Support of More Than 15 Parameters For Outgoing SS7 Messages

Outgoing SS7 messages are no longer restricted to 15 parameters.

### 1.3.10 Support for Multiple SPs Within an SS7 Stack

This release supports multiple signaling points (SPs) within a single SS7 stack. Each SP may specify a different variant (i.e., SP 0 = Generic, SP 1 = Spain, and SP 2 = Australia), but it is not possible to have variants from different SS7 stacks (ANSI and ITU variants cannot exist together).

You may have up to eight different SPs, however, you cannot support link-level redundancy if you exceed four SPs (the SS7 system supports a maximum of eight links). Valid SP values are 0 to 7; you *must start with 0* and increment by ones (i.e. 0, 1, 2...). See *Section 4.3* in the *ITU Integrated SS7, V5.1, System Supplement* for specific configuration information.

You must have at least 64MB RAM available on your system to use this feature.

***NOTE: If you want to use the multi-SP feature, you must first purchase and install additional EBS SS7 software licenses and create new configuration files.***

## 1.4 CORRECTED PROBLEMS

The following are the corrected problems in ITU Release V5.1(2):

U703140003 (CSCsf73844)	If only one host was up and running in a multihost environment, the ROUNDROBIN mode for host load sharing did not work correctly. This issue has been fixed.
U703230001 (CSCsf73857)	If the SDS/VCO Host Control of Call Load feature (set from the System Host Configuration screen of the SDS/VCO Administration Console) was enabled when CktInt started up, all of the \$70 commands CktInt sent to the SDS/VCO to ensure that all of the SS7 ports were on hook were rejected with a network status byte of 3C (\$6C or \$72 command received before host issued \$C0 04 command). If the Host Control of Call Load feature was not enabled, the \$C0 04 command failed, but the \$70 commands succeeded. Cktint now supports both the Host Control of Call Load feature and processing of \$C0 04 commands.
U706160003 (CSCsf74099)	All outgoing continuity check requests initiated by the Host via the SS7 \$49 command coded "continuity check required on this circuit" or "continuity check required on the previous circuit" now work.
U708200007 (CSCsf74268)	If an SS7 \$49 Command was rejected, the host that sent the command became permanently associated with the circuit (or circuit group) specified in the command. This could stop other hosts from using the circuit. Now, cktint sets the controlling host only when the \$49 command is returned as successful.



U802250002 (CSCsf84643)	When cktint received a BLO from the network, the circuit state became remotely blocked in cktint. If the network then sent a CCR, the circuit state became active instead of remotely blocked in cktint. This issue has been fixed.
U803170003 (CSCsf84744)	If a continuity check has been performed and a COT indicating "continuity check successful" is received, cktint disconnects the internal loopback.
U803250008 (CSCsf84787)	When cktint received a BLO from the network, the circuit state became remotely blocked in cktint. If the network then sent an RSC, Newnet EBS would pass a UBL message with a MAINTENANCE primitive instead of an UNBLOCK or RESET primitive. Since cktint did not process the UBL, the circuit was stuck in a remotely blocked state. This issue has been fixed.
U803300002 (CSCsf84793)	When cktint stopped processing calls correctly, stopping cktint software sometimes caused _tcprvcInt to stop functioning also. This issue has been fixed.
U804140002 (CSCsf84825)	If the disconnect control byte in the SS7 \$49 command was dynamically changed by the host, cktint did not adapt to these changes. This issue has been fixed.
U804160001 (CSCsf84828)	If the system switched over after receipt of a SUS message on an active call, the subsequent RES message was not passed to cktint from EBS on the newly active side. This issue has been fixed.
U804300002 (CSCsf84846)	Invalid global CICs from the stack no longer cause cktint to core.
U805080004 (CSCsf84870)	Milliseconds in the time stamp were not printing properly. Now, the millisecond field in the cktint log file is printed properly.
U805180002 (CSCsf84888)	When an IAM with continuity test indication, followed by a COT failed message, is received and a CCR is not received, timer T27 now fires and sends a RSC to the network.
U806180004 (CSCsf84949)	When a \$49 ANM was sent from the host, cktint did not automatically set the disconnect control bits, thus failing to adapt to the \$49 disconnect control bit settings. Now, cktint always sets the disconnect control bits from \$49 commands.
U806300005 (CSCsf84979)	Whenever EBS was started, all the alarms were displayed on the console, even if the alarm display was set to OFF in the MTP Level 2 Provisioning configuration mml file. The alarms now display properly.
U807100001 (CSCsf85015)	Cktint no longer prints error messages when a COT failed message is received from the network for either a present or previous circuit.
U808060001 (CSCsf85051)	At times, no COA was sent from the MTP level in response to a COO from the network. This issue has been fixed.
U808180005 (CSCsf85076)	Outgoing \$49 commands with a REL template were rejected as protocol violation, even when they were sent at appropriate times in the call flow. This issue has been fixed.

## Corrected Problems

U809100002 (CSCsf85104)	When the VCO was configured for Broadcast mode with the Host Control option enabled, outgoing IAMs from a host in an SS7-to-SS7 call flow scenario were not always rejected with "Invalid Controlling Host" if another host had already taken control of the incoming call. This issue has been fixed.
U809100003 (CSCsf85105)	When an incoming IAM continuity check is performed on the present circuit, if a COT success is received, cktint should remove the loop but keep the port off-hook. Instead, cktint was marking the port as on-hook and sending an \$EA report to the host with the port status as inactive. This issue has been fixed.
U809170004 (CSCsf85118)	After a switchover, when a \$70 command got rejected with an NSB of 0F (Invalid Controlling Host), cktint marked the circuit as locally blocked. This issue has been fixed.
U809180004 (CSCsf85122)	When multiple sockets are closed simultaneously, a race condition was preventing cktint from clearing all the sockets. This issue has been fixed.
U809240006 (CSCsf85138)	Outgoing SS7 messages are no longer restricted to 15 parameters.
U810080003 (CSCsf85175)	All possible glare conditions are now supported in the grp_ss7_to_sds file.
U810140005 (CSCsf85196)	Autostart script S85ss7 now works properly.
U812150002 (CSCsf85290)	When a \$49 command is sent from the host, cktint automatically sets the disconnect control bits and adapts to the \$49 disconnect bit settings.
U812170001 (CSCsf85287)	When a \$70 command was rejected with "Invalid Class of Service," cktint hardware blocked the circuit. By enabling -FEATURE_FLAG12 in the CktInt.cfg file, cktint now releases a call, if one exists, and sends an \$EA REL report to the host and a \$70 on-hook command to the VCO.
U812180002 (CSCsf85285)	Whenever a Call Progress (CPG) message was sent/received from the network after an Answer (ANM) message, cktint rejected it. Cktint now accepts CPGs sent after ANMs.
CSCdk77118	Cktint now supports a full 4,000 ports in 4K mode.
CSCdk84405	Cktint stopped processing calls when accessing port in wrong port. This issue has been fixed.
CSCdk85064	Incorrect acknowledgments were sent to the host for successful \$49 commands in extended mode. This issue has been fixed.
CSCdk90689	Cktint was not passing some national parameters (i.e. FF, FE, FD) to the SS7 network. This issue has been fixed.
CSCdm32713	UCIC messages have been deleted from the Hong Kong variant.
CSCdm36851	Cktint rejected IAM messages if a template was specified in an extended SS7 \$49 command. This issue has been fixed.
CSCdm40858	Cktint was rejecting IAMs with resource group numbers between 63 and 223. Resource groups up to 223 are now accepted in 4K extended mode.

CSCdm43972	Cktint was not processing \$69 commands properly in extended mode when outgoing continuity was initiated. This issue has been fixed. \$69 commands are now formatted properly when they are sent to the host in these conditions.
CSCdm44005	In a non-SS7-to-SS7 call with the disconnect control byte set to 00, when the non-SS7 port was released, the \$EA report for the automatic release of the SS7 port by cktint did not contain a cause indicator parameter. This issue has been fixed. \$EA reports sent to the host now contain proper cause indicator parameters.
CSCdm58395	The Australian variant was not handling the "unknown" (FF) parameter properly. This issue has been fixed.
CSCdm68410	When cktint received a LUN message from the network, it did not respond with a LUA message. This issue has been fixed.
CSCdm69718	When a Reset Circuit (RSC) message was sent on a Remotely Blocked circuit and a Release Complete (RLC) message was received from the network, cktint's circuit went to Active instead of remaining in the Remotely Blocked state. This issue has been fixed.
CSCdm71340	When the SS7 signaling link and SS7 circuits were in the same span of E1/T1, and if the E1/T1 went down and came back, the SS7 circuits were stuck in Locally Blocked state. Now the circuits go to Active Idle instead.
CSCdm74341	When an Identification Request (IDR) or Identification Response (IRS) message was received from the network, EBS didn't pass it to cktint. When the host sent these messages, cktint also rejected them. EBS and cktint now accept and properly handle IDR and IRS messages.
CSCdm91301	In a two host scenario, when the last call before a host disconnected was handled by that host, ROUNDROBIN mode would no longer send new calls to the existing host until the second host re-connected. Now when one host fails, ROUNDROBIN passes new calls to the existing host.
CSCdm92123	When a Block (BLO) message was sent from isup_console, an Unblock (UBL) was automatically generated on that circuit and the circuit was not blocked. When another BLO was sent, the circuit was blocked.  A UBL is no longer sent to the network whenever a BLO is sent to the network.
CSCdm92660	Whenever a User-to-User Information (UUI) message was sent from the host on an answered state, cktint didn't send this message to the network. This issue has been fixed.

CSCdp12237	<p>The following error was mistakenly printed in the log file for parameter 1D (user service information):</p> <p style="text-align: center;">**ERROR 040: load_params()- Undefined Parameter Name Found: 0x1</p> <p>This issue has been fixed.</p>
CSCdp13762	<p>When a Release (REL) message is received from the network, cktint automatically generates a Release Complete (RLC) message. By enabling FEATURE_FLAG13 in the CktInt.cfg file, the host initiates an RLC message when an REL message is received from the network.</p>
CSCdp17721	<p>COT Success messages were not being sent to the network if the incoming and outgoing ports were associated (SS7-to-SS7 call), causing circuits to be stuck in a released state. This issue has been fixed.</p>

## 1.5 RELATED DOCUMENTATION

You may want to refer to the following documents that apply to your configuration:

- *ITU Integrated SS7, V5.1, System Supplement*
- *Generic V5.x Release Notes*
- *V5.1 Extended API Programming Reference*

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# Section 2

# SYSTEM REQUIREMENTS

---

## 2.1 INTRODUCTION

This section provides a listing of system requirements for running ITU Integrated SS7 ISUP, V5.1(2). These requirements are divided into hardware, firmware and software.

## 2.2 HARDWARE REQUIREMENTS

ITU Version 5.1(2) requires the following hardware:

- one of the following systems:
  - a VCO/80
  - a VCO/20 with an SS7 VME shelf
  - a VCO/4K with an SS7 VME shelf
- a SPARC CPU5V card
- 32 MB RAM (2K Mode) or 64MB RAM (4K Mode and/or Multi-SP Mode) available on the system

## 2.3 FIRMWARE REQUIREMENTS

There are no special firmware requirements for V5.1(2). However, the firmware in the VCO must have the appropriate revision level required by the Generic. For information, refer to the *Generic Release Notes*.

## 2.4 SOFTWARE REQUIREMENTS

Version 5.1(2) requires the following software:

- Generic V5.x
- Solaris Release V2.6

Valid software checksums and file sizes for the ITU Version 5.1(2) software running on Solaris V2.6 are listed in *Table 2.1*.

**Table 2.1: Cktint Version: ITU Version 5.1(2)**

Filename	Checksum /usr/bin/sum	Size ls -l
cktint.cpio.Z	58661 5045	2582847
install_cktint.sh	14016 12	5655

*NOTE: To get the version of cktint, run the following command in **\$XNV**:*

`% version cktint`

Valid software checksums and file sizes for the AccessManager Version 3.5.4 software running on Solaris V2.6 are listed in *Table 2.2*.

**Table 2.2: EBS Version: 3.5.4**

Filename	Checksum /usr/bin/sum	Size ls -l
ebs.cpio.Z	6789 14090	7213839
install_ebs.sh	15890 7	3523

*NOTE: To get the version of EBS, run the following command in **\$EBSHOME/access**:*

`% more version.dat`

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# Section 3

## SPECIAL CONSIDERATIONS

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### 3.1 INTRODUCTION

This section describes the special considerations you should be aware of while using ITU Integrated SS7, V5.1(2). This section provides explanations for the following areas:

- Commands and reports
- Debug flags
- EBS configuration
- Host considerations
- Redundancy
- System configuration

### 3.2 COMMANDS AND REPORTS

#### 3.2.1 CktInt Requires \$DA And \$DB Reports

Do not suppress the \$DA and \$DB Reports in your SS7 application. These reports are required by CktInt for non-SS7 to SS7 calls and SS7 to non-SS7 calls because of the disconnect control byte. Cktint must see an on-hook.

### 3.3 DEBUG FLAGS

Turning on the debug flags may negatively impact performance.

***NOTE: Make sure all debug flags are turned off for production systems.***

### 3.4 EBS CONFIGURATION

#### 3.4.1 Routing Alarm Messages to the Console

To route alarm messages to the system console, complete the following steps:

1. Start the MML utility by entering the following command and pressing **Return**:

```
mml 0
```

2. At the system prompt, enter the following command and press **Return**:

```
MODIFY-ALARM-CONFIG:DISPLAY=ON;
```

3. Exit the MML utility by entering the following command and pressing **Return**:

```
EXIT::
```

### 3.4.2 Configuration for a Combined Linkset with Two A-Links

In order for link inhibit/uninhibit to work properly in a combined linkset with two A-links, you must set up alternate routes in the **mtp mml** file, as shown in lines 6 and 7 below.

```

MODIFY-SP:NAME=HOME,SPC=3-8-3,NI=NATIONAL,TYPE=SEP;
ADD-LSET:LSET=LSET1,DPC=1-1-1,ACTIVE=1,LOADED=1,TYPE=ALINK,BR=56000;
ADD-LSET:LSET=LSET2,DPC=1-1-2,ACTIVE=1,LOADED=1,TYPE=ALINK,BR=56000;
ADD-LINK:LINK= LINK-0,LSET=LSET1,SLC=0,PORT=1,TYPE=DTE,PRIORITY=0;
ADD-LINK:LINK=LINK-0,LSET=LSET2,SLC=0,PORT=2,TYPE=DTE,PRIORITY=0;
ADD-ROUTE:RTSET=LSET1STP,LSET=LSET2,PRIORITY=1;
ADD-ROUTE:RTSET=LSET2STP,LSET=LSET1,PRIORITY=1;
ADD-CMBLSET:CMBLSET=CLSET12,LSET1=LSET1,LSET2=LSET2;
ADD-RTSET:RTSET=RSET12,DPC=2-2-2,ROUTE1=CLSET12;
MODIFY-LSET:LSET=LSET1,ADMINSTATE=ACTIVE;
MODIFY-LSET:LSET=LSET2,ADMINSTATE=ACTIVE;
EXIT;

```

## 3.5 HOST CONSIDERATIONS

### 3.5.1 Multiple Hosts Affect Call Handling

Additional TCP connections affect SDS/VCO call handling capacity. Optimal performance can be achieved with four or fewer simultaneously active TCP connections.

## 3.6 REDUNDANCY

### 3.6.1 Host Connected to Both Sides

A host must be connected to both the active and standby sides of the SS7 system for reliable redundancy operation.

### 3.6.2 No Switchover When Ethernet Fails

If Ethernet fails, the system does not switch over.

#### Resolution

Add a routine to your host application that can detect when the Integrated SS7 system is unreachable and initiates a switchover.



### 3.6.3 ASCII Terminals On Redundant Systems

If you turn the Integrated SS7 console off, or power to the terminal is lost, the SPARC5V CPU may abort and return to the boot prompt.

It is possible to connect a single ASCII terminal to both side A and side B via an electronic A/B selector switch. However, the selector must be capable of providing surgeless, spikeless change-overs. If the selector switch does not have this feature, the SPARC5V CPU may abort and return to the boot prompt when a change-over occurs.

### 3.6.4 Calls During Switchover

Only stable (answered) calls are preserved by the system during a redundancy switchover.

### 3.6.5 Loss of Network or SS7 Selector Switch Links

The loss of network links does not cause a switchover. Also, the loss of SS7 selector switch links does not cause a switchover. If you are going to perform maintenance on any of the links, you must first switch the system over to the standby side.

### 3.6.6 SDS and VCO/80 Do Not Boot Without SPARC CPU Installed

An SDS or VCO/80 system configured for SS7 does not boot if one of the SPARC CPUs is removed from the Control Subrack. The NBC does not download, the NBC's LEDs stay illuminated, and the SDS/VCO system freezes.

### 3.6.7 Time Between Consecutive Switchovers

Depending on the number of SS7 circuits in your configuration, the SS7 system needs 10 to 30 seconds between two consecutive switchovers to avoid a mismatch in redundancy states of the SDS/VCO, cktint, and EBS.

## 3.7 SYSTEM CONFIGURATION

### 3.7.1 Choosing No Name Service

During system configuration, if you set the Name Service screen to "NONE" and press the **F2** key to continue, the sys-config program will generate an error message and gets into a loop.

Resolution

When running the system sys-config, the system expects any name service to be defined. When you set the Name Service screen option to "NONE," the system still tries to look for any service type and gets into a loop. To run with no name service, you need to create two empty files, as described below, and then rerun the sys-config program from the beginning.

1. From the Name Server screen, mark the "NONE" field and press **F2** to continue.
2. An error message containing a path and file name will be generated. Write down the path and file name.
3. If using a UNIX/Solaris terminal, press **Stop** and then **a**. This will get the "OK" prompt.  
If using a WYSE terminal, press **Cntrl** and then **Pause/Break** or **F5**. Pressing **Alt** and then **Pause/Break** or **F5** may also work. This will get the "OK" prompt.
4. At the "OK" prompt, enter the following command and press **Return**:

```
boot -s
```

This will bring up the system in single user mode. The following message appears:

```
press cntrl-D or enter root password
```

5. At the password prompt, enter the following root password and press **Return**:

```
abc123
```

6. Change the directory (**cd**) to **/etc** and create the files **nsswitch.conf** and **nsswitch.files**, or the file names you wrote down in step 2 if they differ.

Basically, you are creating any files that the system was complaining about in the original error message.

To create the files with vi editor, enter the following command(s) and press **Return**:

```
vi /etc/nsswitch.conf
```

```
vi /etc/nsswitch.files
```

7. Press the **Esc** key. Then, type **:wq** and press **Return**.
8. Verify that the files now exist under directory **/etc**.
9. Change the directory (**cd**) to **/usr/sbin**.
10. Type **sys-unconfig** and press **Return** to un-configure the system and revert to a blank system.
11. Type **reboot** and press **Return** to bring the system back in configuration mode (sys-config).

Continue with the regular sys-config procedure. This time, when you set the Name Service option to "NONE," the system will allow you to configure the rest of the fields without any problem.

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# Section 4

## DESIGN CONSTRAINTS

---

### 4.1 INTRODUCTION

Cisco Systems, Inc. has identified and evaluated design constraints in Integrated SS7 ISUP V5.1(2). This section provides explanations and, where applicable, workarounds in the area that follows:

- Initialization
- Redundancy

### 4.2 INITIALIZATION

#### 4.2.1 U611070001 / CSCsf63489: CktInt Loses Info. When No Host Connected

CktInt does not maintain a socket connection dedicated to the SDS/VCO. If no host is connected, circuit state change information from the system is lost.

### 4.3 REDUNDANCY

#### 4.3.1 U705050007 / CSCsf73966: No Switchover When SS7 Is Stopped On Active Side

The system does not switch over automatically when one of the following conditions occur:

- If the Active CktInt and EBS stacks are stopped
- If CktInt hangs or dies
- If any EBS stack process dies and the MONITOR\_OPTION is OFF (needs to be off to fix the problem where the Ethernet cable is detached and the system will flip flop sides).

#### Resolution

Set the All Host Link Failure Action, on the SDS System Host Configuration Screen, to Conditional Switchover. When the Conditional Switching option is selected, a major alarm is generated if all host links fail and a system switchover is initiated if the Standby controller is on-line (file sync. completed) and has active host links.

### 4.3.2 U707160004 / CSCsf74160: Associated Ports Are Lost After Switchover

CktInt associates ports as specified in the SS7 \$49 Command and the association is maintained until call tear down. If the controlling port is an SDS/VCO port, and the associated port is an SS7 port, the two ports are associated until one or the other is released by the host. When one of the ports is released, CktInt automatically releases the other.

However, if the system switches over while the call is stable, CktInt, on what is now the Active side, has no knowledge of port association established prior to switchover. This is because the CktInt on side A does not communicate with CktInt on side B and vice versa. If the host attempts to release the call by its port association, the release will fail.

If the system switches over a second time, and the call is still stable, the CktInt module that established the port association is now on the Active side, and host can release the call by its port association.

#### Resolution

Do not use the port association option in host applications.

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# Section 5

## KNOWN FUNCTIONAL CONSTRAINTS

---

### 5.1 INTRODUCTION

Cisco Systems, Inc. has identified and evaluated functional constraints in Integrated SS7 ISUP V5.1(2). This section provides explanations, and where applicable, workarounds for functional constraints in the areas that follow:

- Initialization
- Redundancy/Switchover

### 5.2 INITIALIZATION

#### 5.2.1 U708200008 / CSCsf74269: Warmboot With Autostart Takes 20 Minutes

If autostart is configured and the system is warm booted, it will take at least 20 minutes for the SS7 software to start. This will ensure that the VCO is entirely operational before the SS7 software is started.

*NOTE: Do not change this timer value unless you are instructed to do so by Cisco Systems Technical Support.*

Resolution

You may disable the autostart feature. If disabled, the SS7 software must be manually started. To disable autostart, complete the following steps:

1. Log in to the Integrated SS7 system as **root**.
2. Enter the following command and press **Return**:

```
rm /etc/rc3.d/S85ss7
```

3. Reboot the Sparc and autostart will be inactive.

To re-enable autostart, complete the following steps:

1. Log in to the Integrated SS7 system as **root**.
2. Enter the following command and press **Return**:

```
cp /export/home/cktint/cktint-x/bin/S85ss7 /etc/rc3.d/S85ss7
```

3. Enter the following command and press **Return**:

```
chmod +x /etc/rc3.d/S85ss7
```

4. Reboot the Sparc and autostart will be available.

-OR-

Re-install the cktint software. Autostart can be enabled with cktint software installation.

## 5.3 REDUNDANCY/SWITCHOVER

### 5.3.1 U803110006 / CSCsf84706: Synchronization Failure

If EBS and cktint are brought down and back up on the standby side, sometimes the “tli” process does not sync up with the tli process on the active side and the following messages are repeatedly displayed:

```
srv_connect:: An event requires attention  
Enabling connect timer ....
```

This impacts the redundancy operation of the system.

Resolution

Bring down the tli processes on both sides. Then, bring both tli processes back up.

To bring down the tli processes:

1. Log in as **root** to the Standby side of the Integrated SS7 system.
2. Type **px** and press **Return** to verify which active processes are running.
3. Find the tli process I.D. number.
4. Enter the following command and press **Return**:

```
kill -9 <process I.D. #>
```

5. Log in as **root** to the Active side of the Integrated SS7 system, then repeat step 1 through step 4.

To bring both tli processes back up:

1. Log in as **root** to the Active side of the Integrated SS7 system.
2. Enter the following command and press **Return**:  

```
tli &
```
3. Log in as **root** to the Standby side of the Integrated SS7 system, then repeat step 1 through step 2.

