

AccessWare and Call Detail Recording

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Summary

The AccessSwitch has the capability to output to either of the LMC/NMC ports Call Detail Recording (CDR) information in a textual form. The concept is that this information could be captured in real-time by an external device, stored, and later downloaded and decoded by a third party to determine how to perform billing/charge allocation for calls made through the AccessSwitch.

This document describes and demonstrates the CDR billing traces for common AccessSwitch and software release configurations, derived from experience of Video networking customer configurations.

Examples of CDR traces for all the tests are included.

The intended audience for this technical bulletin is:

- AccessSwitch Reseller Systems Engineers providing pre and post sales support for customer solutions requiring billing or charge allocation
- Third party billing solution providers

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1 Introduction

1.1 Purpose

The AccessSwitch has the capability to output to either of the LMC/NMC ports Call Detail Recording (CDR) information in a textual form. The concept is that this information could be captured in real-time by an external device, stored, and later downloaded and decoded by a third party to determine how to perform billing/charge allocation for calls made through the AccessSwitch.

This document describes and demonstrates the CDR billing traces for common AccessSwitch and software release configurations, derived from experience of Video networking customer configurations.

1.2 Scope

This document describes the CDR trace that is output for AccessSwitch release 16 and AccessSwitches prior to release 16. Model 20 trace output was not tested, but should be similar to AccessSwitch releases prior to Release 16.

All AccessWare releases since R16 have provided the same CDR capabilities as release 16.

This document does not attempt to cover all possible AccessSwitch topologies, and codec types and connectivity. It identifies only those Initia considers prevalent in the market place.

1.3 Definition, Acronyms and Abbreviations

CDR	Call Detail Reporting - a capability of the AccessSwitch, that reports call information on trunks only (incoming and outgoing with respect to the hub). Call information is reported only once for a call, on termination of the call, and includes the call duration
CER	Call Event Reporting - a capability of the AccessSwitch that reports call information on all lines, with respect to a line card (i.e. incoming and outgoing is with respect to a card in the hub). Call information is reported at several stages of call establishment and disconnection, the duration has to be deduced by matching connection/disconnection messages for a line.
AccessSwitch	Generic term used in this document to describe a hub with 6 slots or 20 slots, and supplied both to the non-Carrier and Carrier (badged as ESN) markets.

1.4 Overview

Chapter 2 describes the format and meaning of a CDR record. Much of this information is in the NMC User Manual, but is included here for completeness, and a little more detail is provided.

Chapter 3 is the where the most significant information not easily available elsewhere is found. It describes issues and constraints surrounding the implementation of a customer billing solution.

Chapter 4 defines the Initia test environment – the goal was to generate a wide and useful range of CDR traces representative of many real world network and codec configurations.

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Chapter 5 presents the test descriptions and the CDR trace gathered in those tests, both for Release 14 and Release 16 AccessSwitches.

1.4.1 Reading Plan

The document chapters can be selected for reading according to the interest of the reader.

Systems engineers Chapters 2 and 3

Billing Solution Providers All Chapters

2 Definition of CDR format

2.1 Definition conventions

The conventions used to illustrate the CDR format are as shown in Table 1 and Table 2.

Convention	Meaning
Large courier characters, e.g. :	Character with fixed value and position in the record.
Non-italicised courier characters	Each character represents exactly one character of variable value in the output record
Lower case italic characters	Represents a variable length string of characters

Table 1 - Font conventions

Field code	Present in Releases	Brief description
D	all	Single character defining Direction relative to trunk (I for incoming, O for outgoing with respect to AccessSwitch)
YYYYMMDD	all	Date stamp that call was connected, in Year/Month/Day format
HHMMSS	all	Time stamp that call was connected, in Hours/Minutes/Seconds format
hhmmss	all	Duration of call connection, in Hours/Minutes/Seconds format
SSLL	16	Origination/Destination information in Slot/Line format
SSLLCC	all	Trunk Identifier, in Slot/Line/Channel format
<i>calling</i>	all	Calling Party Identifier, variable length. Can be zero digits in length
<i>called</i>	all	Called Party Identifier, variable length. Always one or more digits
CC	16	Call Content, two digits
T	16	Channel Type, one digit
RR	16	Rate Multiplier, two digits

Table 2 - Field naming conventions

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2.2 Previous to Release 16

Definition:

`D:YYYYMMDD:HHMMSS:hmmss:SSLCC:*calling: called*

Example record output:

`I:19970321:013503:000029:050023:7325450112:0210

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Definition:

`D:YYYYMMDD:HHMMSS:hmmss:SSL:SSLCC:*calling: called*:CC:T:RR

Example record output:

`I:19970308:050933:000008:0200:010101:7325450112:9085440210:08:1:01

2.4 Field Value Detail

The following sub-sections provide more detail on decoding the fields.

2.4.1 Interpreting the Direction, Trunk Identifier, and Origination/Destination fields

Table 3 is used to decode the value of the Direction field and determine the type of call being made.

Direction	Trunk Identifier	O/D Identifier	Type of Call
I	VALID Slot and Line of Originating Trunk	NOT PRESENT	A Trunk to Port call on a hub predating R16.
O	VALID Slot and line of Destination Trunk	NOT PRESENT	An outgoing call to a Trunk on a hub predating R16. It is not possible to determine if the call originated from a Trunk or a Port, except perhaps by the value of the Calling Party Identifier field.
I	xxxxxx INVALID	xxxx INVALID	A Port to Port IMUX call
I	VALID Slot and Line of Originating Trunk	xxxx INVALID	A Trunk to Port IMUX call
I	VALID Slot and Line of Originating Trunk	VALID Slot and Line of Destination Port	A non-MUX call to a Port. It is possible to determine if the call originated from a Trunk or a Port by knowledge of the location of the interface cards in the hub, and/or by the value of the Calling Party Identifier field.
O	VALID Slot and Line of Originating Trunk or Port	VALID Slot and Line of destination Trunk	An outgoing call to a Trunk. It is possible to determine if the call originated from a Trunk or a Port by knowledge of the location of the interface cards in the hub, and/or by the value of the Calling Party Identifier field.

Table 3 - Decoding Call Type from Direction, Trunk Identifier and O/D Identifier CDR fields

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- **Slot and Channel information is 1 based** (slots 1..20, channels 1 upwards).
- **Line information is 0 based** (Lines 1 to 4 for a board are represented as 0 to 3).

The channel digits of the Trunk Identifier provide further information as shown in Table 4.

Trunk Identifier Channel value	Meaning
1-31	Non-hybrid call, indicates channel in use on line
41,42,43 or 44	Hybrid H0 call, on channels 1-6, 7-12, 13-18, 19-24 (NFAS) respectively
51	Hybrid H10 call
61	Hybrid H11 call
71	Hybrid H12 call

Table 4 - Decoding Call type from Trunk Identifier Channel Value

2.4.2 Date and Time

The date and time-stamps are self-explanatory, as is the duration field.

Note that Release 16 has been tested for Compliance with Year 2000. Previous releases may give anomalous output at the Year 2000 in CDR and other NMC/hub date information.

2.4.3 CDR DN selection and number Lengths

Table 5 is used to decode the dial string information contained in the CDR record fields *Calling Party Identifier* and *Called Party Identifier*:

Note: for releases prior to Release 16, no CDR record is output for a Port to Port call.

Call Type	Release	Calls from Trunks	Calls from Ports
Public	< R16	3 digit (or 0 ¹) Origination hub area code + 7 digit DN	Last 4 digits of DN
Private	< R16	N digit DN	Last 4 digits of DN ²
Public	R16	3 digit (or 0 ¹) Origination hub area code + 7 digit DN	Last 4 digits of DN
Private	R16	N digit DN	Last 4 digits of DN ³

Table 5 - Calling Party DN length and composition

¹ For the Public dial-plan, if the first 3 digits of the Calling Party Id. matches the Area Code provisioned for the billing AccessSwitch, the Area Code digits are suppressed in the Calling Party DN CDR output (i.e. 7 digits only displayed).

² If the DN provisioned on the port is neither 4 nor 7 digits, the calling party identifier is not displayed in the CDR record, and future CDR output may be suspended

³ If the DN provisioned on the port is neither 4 nor 7 digits, no calling party identifier digits is not displayed in the CDR. CDR output is NOT suspended.

If multiple DNs are provisioned on a port, the DN selected for use as the Calling Party Identifier is chosen from the appropriate table from Table 6, Table 7, 1 If **multiple DNs have been**

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provisioned for the port, and none of them is selected as the primary DN, it is not well defined which DN is reported as the Calling Party Identifier.

Table 8 or Table 9, depending on Release version and Call type, in order of priority with the highest priority selection first in each table.

Terminology. Where the term “First DN” is referred to, the DN used is the first DN in the AccessSwitch LMC/NMC list provisioned for that slot and line. This can be determined by using the CallView command “`SP slot, line`”, but not from the provisioning menus in the NMC which may show a different ordering.

Public Call	Private Call
Public Primary DN	Private Primary DN
Private Primary DN	Public Primary DN
no DN ¹	no DN ¹

¹ There is no Calling Party Identifier if there is no Primary DN provisioned on the port.

Table 6 - Previous to Release 16: Multipoint or SPID provisioned ports (e.g. most BRI except Europe and 5E custom)

Public Call	Private Call
Public Primary DN	Private Primary DN ¹
First DN	First DN
no DN	no DN

¹ The Public Primary DN is supplied in this case, if a Public Primary DN has been provisioned for this port in addition to the Private Primary DN

Table 7 - Previous to Release 16: Non-multipoint, non-SPID provisioned ports (e.g. 5E custom BRI, PRI port, or V.35/RS449 port)

Public Call	Private Call
Public Primary DN	Private Primary DN
Private Primary DN	Public Primary DN
Non-Primary Public DN ¹	Non-Primary Private DN ¹
Non-Primary Private DN ¹	Non-Primary Public DN ¹
no DN	no DN

¹ If multiple DNs have been provisioned for the port, and none of them is selected as the primary DN, it is not well defined which DN is reported as the Calling Party Identifier.

Table 8 - Release 16: Multipoint or SPID provisioned ports (e.g. most BRI except Europe and 5E custom)

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Public Call	Private Call
Public Primary DN	Private Primary DN
First DN	First DN
no DN	no DN

Table 9 - Release 16: Non-multipoint, non-SPID provisioned ports (e.g. 5E custom BRI, PRI port, or V.35/RS449 port)

Note that if the DN selected by consulting the tables above is not the same type as the type of call (e.g. a Public Primary DN chosen for a Private call), then the DN length and structure must be determined by using the DN type rather than the Call type to index into the Calling Party DN length tables above.

Call Type	Release	Calls to Trunks	Calls to Ports
Public	< R16	3 digit trunk qualifier ¹ + 7 digit Public DN	4 digit DN
Private	< R16	M digit trunk qualifier + N digit Private DN.	N digit Private DN ²
Public	R16	3 digit trunk qualifier + 7 digit Public DN	4 digit DN
Private	R16	M digit trunk qualifier + N digit Private DN	N digit Private DN ³

Table 10 - Called Party DN length and composition

¹ For the Public dial-plan and releases prior to R16, if the trunk qualifier is 3 digits and matches the area code provisioned for the billing AccessSwitch, the trunk qualifier digits are suppressed in the Called Party DN CDR output (i.e. 7 digits only displayed).

² If the DN provisioned on the port is neither 4 nor 7 digits, the called party identifier is not displayed in the CDR record, and future CDR output may be suspended

³ If the DN provisioned on the port is neither 4 nor 7 digits, no called party identifier digits is not displayed in the CDR. CDR output is NOT suspended.

2.4.4 Call Content Field

The two digits call content field is decoded as shown in the table below.

Call Content digits	Call Content
00	Speech call
08	Unrestricted digital data
09	Restricted digital data
10	3.1 KHz Audio
11	7 KHz Audio
18	Video

Table 11 - Call Content Field

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2.4.5 Channel Type Field

The one digit channel type is decoded according to the table below.

Channel Type digit	Channel Type
1	B-channel
2	H0
3	H10
4	H11
5	Multirate

Table 12 - Channel Type Field

2.4.6 Rate Multiplier Field

This two digit field specifies the number of channels used by the call. This information is critical for Multirate calls.

3 Pre-conditions for Successful Billing Applications

Users proposing or setting up a billing solution for deployment need to be aware of the following golden rules and constraints.

3.1 Calling Party Identification

For accurate Calling Party Identifier information in billing, manual procedures need to be put in place by the AccessSwitch operator to ensure attached ISDN terminals/devices that supply a Calling Party Identifier in the call setup, are provisioned with an appropriate Calling Party Identifier.

The AccessSwitch always uses a received Calling Party Identifier if present in an incoming setup message, in preference to any number provisioned in the AccessSwitch for that interface. Furthermore, the AccessSwitch does NOT attempt any validation of the Calling Party Identifier received in the call setup, nor does it modify or extend the Calling Party Identifier.

Each bill-able end-point (port) should be provisioned with at least one DN. A DN should be selected as the Primary DN.

An exception can be made when attached BRI terminals or PRI devices can be provisioned to supply their own Calling Party Identifier in the call setup message they send to the AccessSwitch.

When a call originates from a port, the calling party identifier in the CDR record reported is determined as follows:

- If the call was launched from the NMC CIU “Connect” command dialog box; and a “source identifier” calling party number was specified by the NMC user, then the number entered as the source identifier is presented as the CDR Calling Party Identifier.
- Otherwise, if the attached terminal/device supplied a Calling Party Identifier in the call setup, this is presented as the Calling Party Identifier.

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- Otherwise, if DN's are provisioned on an interface, the DN selected for use as the Calling Party Identifier is chosen from the tables presented in *2.4.3 CDR DN selection and number Lengths* according to the type of interface and software release.
- Otherwise, if no DN's have been provisioned for the port, there is no calling party identifier in the CDR record - the field is empty.

It is required (but not enforced by the NMC) that each public DN provisioned should be of length 7 digits

Failure to comply with this requirement, can cause unexpected truncation or padding with leading zeroes of the DN provisioned when it appears as the Calling Party Id. In the CDR output.

It is recommended that each Private DN provisioned should be of length 4 or 7 digits

Failure to comply with this recommendation can cause CDR output to be suspended in Releases prior to 16, or empty Calling Party Id. Fields in Release 16.

It is required that if Private DN's of different lengths are provisioned on a port, that the DN to be used for reporting CDR Calling Party Identifier be explicitly provisioned as the Primary Private DN

Failure to comply with this requirement causes the First DN to be output as the CDR Calling Party Id. with truncation or padding with leading zeroes so that it matches the length of the Last DN.

3.2 Limitations of Hubs and Model 20s

The following limitations are common to hubs of any software release.

Little testing of CDR output for H12 calls over E1 has been done. There are no defined values to indicate H12 call types in the Channel Type field.

It is not recommended to build billing solutions involving H12 calls without further investigation and characterization of CDR output (if present) for these calls.

The hubs do not recognize or generate ANI information for T1 trunks. Therefore, the CDR Calling Party Identifier field is empty for incoming calls on a T1 trunk

Interconnection of hubs should usually be by ISDN PRI or BRI lines. For some applications (e.g POTS lines to Channel Bank, connected by T1 to a hub) the T1 connection can be provisioned in the hub as a T1 Port with a DN for each T1 channel, for calls routed from the T1 through the hub, the Calling Party Identifier reported in the CDR trace is the DN provisioned for the channel of the incoming call on the T1 port.

Private dial-plans should be provisioned to take account of the many restrictions or changes made in the CDR presentation of DN's provisioned on a port that are neither 4 nor 7 digits in length (ref. 2.4.3 CDR DN selection and number Lengths)

In order to get complete and unambiguous reporting of Called and Calling Party DN's in the CDR output it is necessary to be aware of the billing limitations in this area.

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3.3 Limitations of Model 20s and Hubs previous to Release 16

Only Release 16 hubs generate CDR records for port to port (intercom) calls

A workaround for older hubs is to ensure that all bill-able calls arrive or depart on a trunk by attaching the codes to satellite hubs/model 20s.

Only Release 16 hubs generate an additional CDR field identifying the physical slot and line of both the entry and exit points the call uses in the billing hub

Previous releases report physical slot and line information for the trunk part of the call only. For a tandem call (trunk to trunk), the CDR record shows the call is outgoing and gives the information for the outgoing trunk only

Only Release 16 hubs generate an additional CDR field identifying the Call Content

Previous releases do not generate this information. No workaround is known.

Only Release 16 hubs generate an additional CDR field identifying the Channel Type

Previous releases do not explicitly generate this information. Limited workarounds may be possible:

Nx IMUX calls can be deduced from the sequence of CDR records for each channel, with the approximate same time stamp, and use of pooled DNs for N-1 of the calls in most cases.

Hybrid H0 calls can be recognized by detecting 41,42,43 or 44 in the channel information of the CDR trunk identifier field.

Hybrid H10 calls can be recognized by detecting 51 in the channel information of the CDR trunk identifier field.

Hybrid H11 calls can be recognized by detecting 61 in the channel information of the CDR trunk identifier field

Hybrid H12 calls can be recognized by detecting 71 in the channel information of the CDR trunk identifier field

Only Release 16 hubs generate an additional CDR field identifying the Rate Multiplier

Previous releases do not explicitly generate this information. Limited workarounds may be possible:

Nx IMUX calls can be recognized as Nx rate multiplier by detecting and counting the sequence of CDR records for each channel, with the approximate same time stamp, and use of pooled DNs for N-1 of the calls in most cases.

Hybrid H0 calls can be recognized as 6x rate multiplier by detecting 41,42,43 or 44 in the channel information of the CDR trunk identifier field.

Hybrid H10 calls can be recognized as 23x rate multiplier by detecting 51 in the channel information of the CDR trunk identifier field.

Hybrid H11 calls can be recognized as 24x rate multiplier by detecting 61 in the channel information of the CDR trunk identifier field

Hybrid H12 calls can be recognized as 30x rate multiplier by detecting 71 in the channel information of the CDR trunk identifier field

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Releases before Release 16 may have an empty CDR Calling Party Identifier field for outgoing calls on a 5E trunk

This has only been shown to occur in two specific scenarios, on Private dial-plan calls only. The Calling Party Identifier is missing from the CDR trace when either:

- 1. Dial from a 5E BASIC BRI phone directly out a 5E PRI line.
NOTE: This does not apply to NI1 phones.*
- 2. Calls coming in via a 4E PRI then being immediately routed out 5E PRI.
NOTE: no problem has been seen with calls coming in via 5E PRI and being routed immediately to a 5E PRI.*

The limited workaround is to avoid the above scenarios when the Calling Party Identifier is required.

Releases before Release 16 may have an empty CDR Calling Party Identifier field for incoming dual calls on a BRI. The CDR record for the second incoming call does not have the Calling Party Identifier field.

A workaround is possible when the attached terminal or device generating the call can be provisioned with a Calling Party Identifier that it includes in its call setup message to the AccessSwitch. That information overrides any DNs provisioned for that interface in the AccessSwitch. The Calling Party Identifier supplied by the terminal is presented in the AccessSwitch billing records for each of the calls.

Model 20s do not provide Calling Party Identifier information when routing Private dial-plan calls out on a PRI. Therefore the CDR Calling Party Identifier field generated from an AccessSwitch is empty for incoming calls on a PRI line from a Model 20 when the call was launched using a Private dial-plan from the Model 20.

The workaround on the Model 20 is to provision the Model 20 to route calls out of the Model 20 PRI using the public dial-plan. BRI connection of Model 20 to AccessSwitch does not seem to have this private dial-plan problem.

Only Release 16 hubs can be configured so that billing to a recording device attached to the LMC port persists after hub power outages and hub resets. In a redundant INP configuration, the Standby INP that takes over on Master INP failure remembers the billing configuration.

Previous releases do not provide this functionality. Limited workarounds are to use a UPS and/or chassis with redundant power supplies, and after hub resets, promptly re-issue billing commands.

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3.4 Limitations of Release 16

For incoming IMUX calls (Trunk to Port), the CDR field “O/D slot/line” is invalid. This is indicated by the field being filled out with a stream of “x” characters.

For Port to Port IMUX calls, the CDR fields “Trunk Identifier” and “O/D slot/line” are both invalid. This is indicated by the fields being filled out with a stream of “x” characters.

It is not recommended to use the slot/line information as input to billing applications where the above conditions are encountered.

4 Testing Environment

The test environment for setting up and conducting the tests to gather the CDR traces are as described in this chapter.

4.1 Common Test Configuration

The configuration shown in Figure 1 is used for all tests.

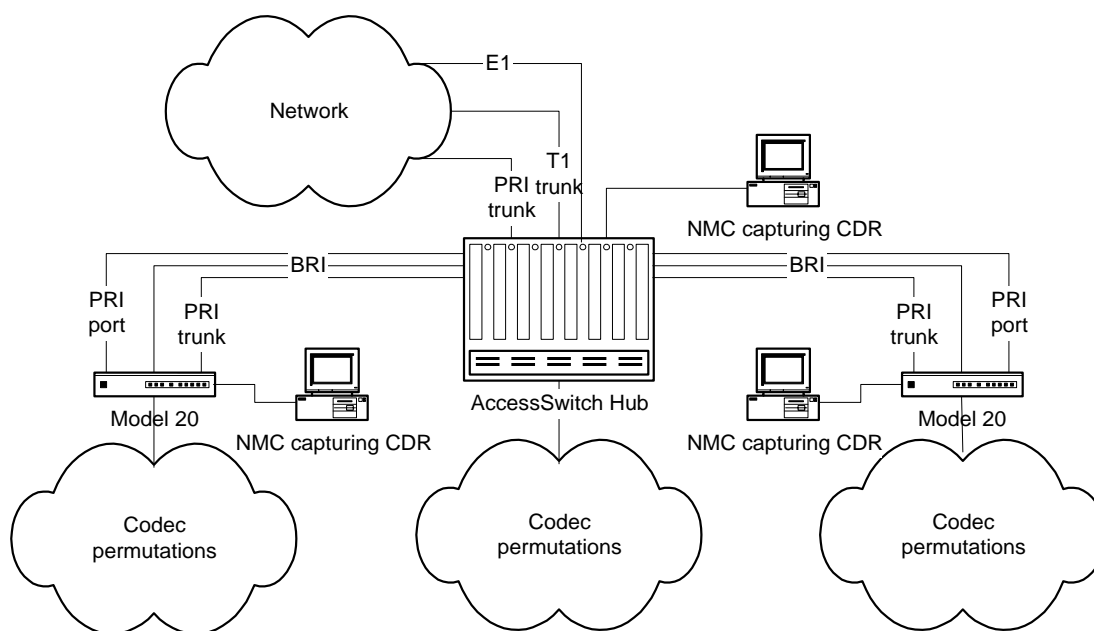


Figure 1 - Common Test Configuration

Multiple model 20s are connected by PRI lines to an AccessSwitch. The AccessSwitch is connected to the network by a PRI and a T1 connection.

The provisioning of all hubs remains constant throughout the tests.

CDR output is gathered and collated for each call made under each test from:

- the hub attached to the originating codec (usually a Model 20)
- the hub attached to the destination codec (usually a Model 20)
- the tandem hub (an AccessSwitch)

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CDR records gathered from Model 20s are used to complete the documentation of billing behavior. However, Initia does not expect Billing Solutions to use this CDR output, but to gather it centrally at the tandem hub.

CDR records gathered from the tandem hub (AccessSwitch) are directed to a recording device in a Billing Solution, such as a solid state recorder. Alternatively, a convenient recording device that allows the CDR trace to be captured is used, e.g. the NMC CallView log.

4.2 Test Variables

The variables in the test configurations include:

- AccessSwitch loaded with Release 16, and AccessSwitch loaded with a previous release (Release 14).
- Nature of connection of codec to Model 20 and AccessSwitch (V35, single/multiple BRI, PRI).
- Different DN provisioning options for the codec connection.
- Dial plan provisioning (a single dial-plan comprising multiple LEC carrier dial-plans, and a private network dial plan).
- Calls routed from the network over both T1 and PRI
- Calls routed between the Model 20s and AccessSwitch over PRI lines provisioned as Ports on the Model 20, and provisioned as Trunks on the model 20.
- Calls routed from a model 20 to the network, codecs on the AccessSwitch, and codecs on the other model 20
- Single calls, and back to back calls of the same type
- Call rate and type. The tests standardized on IMUX 6x, H0, Multirate 6x, 2xB channel calls over a single BRI, 1x B channel calls.
- A call originated from the NMC CIU using a QRVX specifying a value for the source identifier (verify CDR calling party identifier is this value)

The primary purpose of the tests was to obtain sample sets of billing output that cover all different choices of each of variables above. Multiple variables were changed between each test run on the configuration in order to reduce the testing cycles.

The goals of the testing were not defined to include all or most permutations of the above, or to generate high call traffic.

The sections below provide more detail on each variable, and the purpose of varying its state under these tests.

4.2.1 AccessSwitch Software Release

Initia recommends providing billing solutions using Release 16 or later. However, there are many opportunities to provide billing solutions using existing customer equipment at many sites, some of which is older than Release 16. This includes Model 20s.

The call detail output is often collected from a single central AccessSwitch attached to the network. This billing output is significantly different between Release 16 and earlier releases.

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Therefore both Model 20s, AccessSwitch Release 16, and AccessSwitch software prior to Release 16 were tested. Note that one consequence of this is that certain facilities were not available in earlier releases, e.g. Multirate, and that was worked around in the tests by avoiding using features not implemented throughout the test network.

4.2.2 Codec Connections

The following codec connections produce significantly different billing output, exercising the billing output decoding.

- V35/RS449 attached to QRVX. In these cases, the codecs were not needed to run tests, as the NMC CIU interface could be used. The CDR output would not have been different if a codec were to have been attached.
- Desktop codec attached to OBIU board by a single BRI line.
- PictureTel codec with built-in IMUX connected to OBIU board by three BRI lines. Both one DN per BRI line, and one DN per BRI B-channel configurations were tested
- Ascend PRI unit with up to 4 V35 ports for connection of codecs. An Nx IMUX call to an Ascend PRI unit consists of N Primary DN setups versus a Nx IMUX call to a model 20 which consists of one Primary DN setup, and N-1 Pooled DN setups.

4.2.3 DN Provisioning Options for the Codec Connection

Codecs connected to the hub by BRI lines, were tested with both one DN per BRI line, and one DN per BRI B-channel configurations.

4.2.4 Dial Plan Provisioning

Calls to and from the test network were tested with two different dial plans to simulate the real world provisioning of the switches under test.

Calls made without going onto the network were made using a private dial plan.

All the above dial plans were combined so that the switches in the test configuration were provisioned only once.

4.2.5 Network Connectivity

Calls were made from the network using both PRI and T1. To avoid re-provisioning, both lines were present and configured. The network was simulated by another AccessSwitch, which was Release 16, so that Multirate calls to and from the network could be simulated in the test configuration.

For PRI calls originating from the network, the Calling Party Identifier were valid, whereas for T1 it they were not (T1 does not provide a Calling Party Identifier mechanism).

4.2.6 Model 20 PRI connectivity

Model 20 PRI connections to the AccessSwitch were provisioned as Trunk, and in other tests as Port, to mirror the configurations encountered in customer sites. To avoid Model 20 re-provisioning during tests, two PRIs were connected per Model 20, one provisioned as a Port, one provisioned as a Trunk.

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4.2.7 Call Routing

The CDR output is significantly affected, or even missing in Releases before Release 16, depending on the combination of Ports and Trunks used to route the call through the hub generating the CDR billing information. Therefore combinations of call routing included those below.

Local calls:

- from codecs attached to a model 20, to codecs attached to another model 20
- from codecs attached to the AccessSwitch to codecs attached to a model 20
- from codecs attached to a model 20 to a codec attached to an AccessSwitch
- from codecs attached to the AccessSwitch to codecs attached to the same AccessSwitch

Outbound calls (to network)

- from codecs attached to a model 20, to the network
- from codecs attached to the AccessSwitch to the network (another AccessSwitch for test purposes)

Inbound calls (from network)

- codecs attached to a model 20
- codecs attached to the AccessSwitch

4.2.8 Call Launching

Calls made for each test were repeated as follows.

- Call#1 connect (30 seconds), disconnect
- 30 second delay
- Call#2 connect (15 seconds), disconnect
- 0 (or close to 0) second delay
- Call#3 connect (15 seconds), disconnect.

In this way, for each type, the first call is the simple example; the next two calls complicate billing decoding due to their close temporal proximity. Clarification is especially important for IMUX calls.

4.2.9 Call Rate and Type

In most cases, these were constrained by the codec type. The number of channels used for a call (above 1) does not significantly affect the billing output. Therefore Initia standardized on a bandwidth multiplier shared by many call types, and verified that these distinctions could be made in the billing output.

6x (384 kbps) calls corresponding to the H0 rate were used for these tests, the types below were also included:

- IMUX: 6 channel IMUX
- H0: 6 channel NONE (=H0)
- Multirate: 6 channel MULTIRATE

Where 6x calls cannot be made to the codec (e.g. single BRI line codecs) then the following were performed:

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- IMUX 2 channel
- Non-IMUX 2x56 or 2x64 kbps
- Multirate 2x calls

5 CDR Traces

This section provides traces and commentary for the selected test scenarios. Together, these scenarios cover all of the testing requirements specified in the previous chapter.

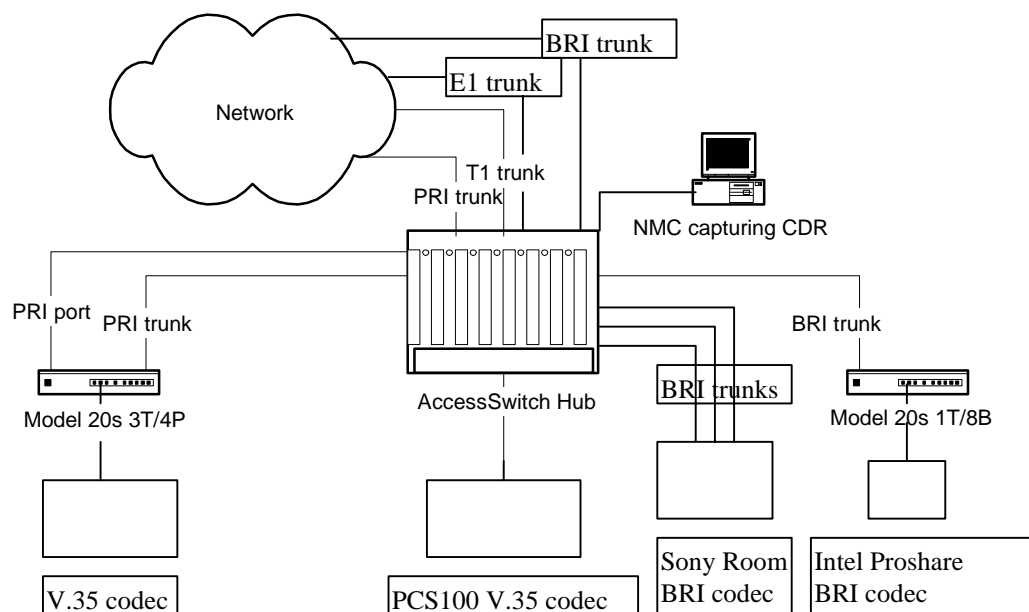


Figure 2 - Test Configuration

For each scenario, the trace for the latest AccessSwitch release (R16/CS 1.0), and the previous AccessSwitch release (R14.1) are shown.

In addition to the configuration shown above, an Ascend IMUX 3 BRI unit was connected to the M60 running Release 16 for a single test.

In addition to the configuration above, another test setup was configured to test the billing generated by the Release 16 EKTS *Call Forward Unconditional*, *Call Forward Busy* and *Call Forward No Answer*. This is shown in Figure 3.

In the CDR record columns of the tables below, only the lines prefixed by the grave ` character are output from the slotted hub. Other lines of text are commentary added for clarification.

5.1 Common conventions

These are the conventions used in these test scenarios only. Customers obviously have their own conventions, which may be different from those below.

- Private dial-plan calls are indicated by an '8' prefix.
- Public dial-plan calls are indicated by a '9' prefix.
- Pooled DN numbers end in '9000'.

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- Private DN numbers end in '8000'.

In these test configurations, a large number of area codes are in use, multiple for each hub or Model 20. This is done in the test environment to simplify the construction of trunk group qualifiers for routing calls over the appropriate line type for the test. The detail of this provisioning is not described here, and is not necessarily representative of customer usage.

5.2 CDR Billing Feature Test Scenario for M20S 3T/4P

All calls incoming from M20S 3T/4P attached to Model 60 by PRI.

- Note: A private call may be missing the calling party number even with primary DN provisioned on the M20s SAIU card. Calls from the Model 60 to the Model 20 are displayed correctly on both the M60 and M20 side.

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Make a Dual call from PCS100 connected via V.35 to the M20s 3T/4P over a PRI trunk to the M60. Then from the M60 over another PRI trunk to the Intel Proshare connected to the M20s 1T/8B via BRI. (Trunk to Trunk Call)	9(505)544-0330 (Non Imux) 9(505)544-3330 (Non Imux)
`O:19970821:011225:000041:050319:7325450112:4035440330 `O:19970821:011233:000033:050320:7325450120:4035443330	Release 14
`O:19970817:003700:000043:0500:050319:7325450112:4035440330:08:1:01 `O:19970817:003708:000036:0500:050320:7325450120:4035443330:08:1:01	Release 16

Table 13 - Test Reference M20PRI.1

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Make a 1x non imux call from the CIU of the M20s 3T/4P to the QRVX in the M60 over a PRI trunk. (Trunk to Port call)	9(502) 546-0210 (Non Imux) 8(502) 546-0210 (Non Imux)

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Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Public call `I:19970821:013503:000029:050023:7325450112:0210 Private call `I:19970821:013908:000007:050023::0210	Release 14 ***
Public call @ 64K `I:19970807:004950:000047:0200:050023:5450112:0210:08:1:01 Private call @56K `I:19970807:005449:000022:0200:050023::0210:09:1:01	Release 16 ***

Table 14 - Test Reference M20PRI.2

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Make any type of call from the CIU of the M20s 3T/4P over a PRI trunk to the QRVX in the M60. Provision a different DN in the source ID field in the CIU window. This DN should be the one in the CDR information. (Trunk to Port call)	9(502) 546-0222 (Imux)
Public 10x64K IMUX call, value specified in CIU Source Identifier was 555 9876 `I:19970821:015118:000010:050014:5559876:9000 `I:19970821:015117:000011:050015:5559876:9000 `I:19970821:015117:000011:050016:5559876:9000 `I:19970821:015117:000011:050017:5559876:9000 `I:19970821:015117:000012:050018:5559876:9000 `I:19970821:015117:000012:050019:5559876:9000 `I:19970821:015116:000013:050020:5559876:9000 `I:19970821:015116:000013:050021:5559876:9000 `I:19970821:015116:000013:050022:5559876:9000 `I:19970821:015115:000015:050023:5559876:0222	Release 14
Public 10x64K IMUX call, value specified in CIU Source Identifier was 555 1111 `I:19970807:010308:000019:XXXX:XXXXXXX:5551111:9000:08:1:01 `I:19970807:010308:000019:XXXX:XXXXXXX:5551111:9000:08:1:01 `I:19970807:010308:000019:XXXX:XXXXXXX:5551111:9000:08:1:01 `I:19970807:010308:000020:XXXX:XXXXXXX:5551111:9000:08:1:01 `I:19970807:010307:000020:XXXX:XXXXXXX:5551111:9000:08:1:01 `I:19970807:010307:000021:XXXX:XXXXXXX:5551111:9000:08:1:01 `I:19970807:010307:000021:XXXX:XXXXXXX:5551111:9000:08:1:01 `I:19970807:010307:000021:XXXX:XXXXXXX:5551111:9000:08:1:01 `I:19970807:010307:000022:XXXX:XXXXXXX:5551111:9000:08:1:01 `I:19970807:010306:000023:XXXX:XXXXXXX:5551111:0222:08:1:01	Release 16

Table 15 - Test Reference M20PRI.3

AccessWare and Call Detail Recording

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Make a 1x non imux call from the CIU of the M20s 3T/4P over a PRI trunk connected to the M60, then routed out to the network hub over a BRI trunk. (Trunk to Trunk call)	9(503) 547-1610 8(503) 547-1610
Public `O:19970821:020907:000007:040501:7325450112:4415471610 Private `O:19970821:024204:000023:030041::4125471620	Release 14 ***
Public `O:19970807:011012:000013:0500:040501:5450112:4415471610:08:1:01 Private `O:19970807:011704:000022:0500:040501::4415471610:08:1:01	Release 16 ***

Table 16 - Test Reference M20PRI.4

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Make a H0 call from the CIU of the M20s 3T/4P over a PRI trunk connected to the M60 and routed to the network hub over a E1 trunk connected from the M60 to the network hub. (Trunk to Trunk call)	9(504) 547-1620 8(504) 547-1620
Public: `O:19970821:023532:000019:030041:7325450112:4125471620 `O:19970821:023621:000015:030041:7325450112:4125471620	Release 14
Incorrect test configuration - no records recorded under test	Release 16

Table 17 - Test Reference M20PRI.5

5.3 CDR Billing Feature Test Scenario's for M20S 1T/8B

All calls incoming from M20S 1T/8B attached to Model 60 by BRI.

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Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Make a 64k Dual call from a Intel Proshare Desktop codec connected to the M20s 1T/8B via BRI to the M60 over another BRI trunk. Then route the call through the M60 to the M20s 3T/4P over the PRI trunk. The call should land on the codec connected to the M20s 3T/4P. (Port to Trunk call)	9(301) 545-0110 9(301) 545-0120 (Dual Call) 8(301) 545-0110 8(301) 545-0120 (Dual)
Public \O:19970821:011434:000434:050019:0330:4015450110 \O:19970821:011437:000431:050020:3330:4015450120 Private \O:19970821:011958:000257:050019:0330:4015450110 \O:19970821:012005:000250:050020:3330:4015450120	Release 14
Public \O:19970817:002914:000040:0400:050019:0330:4015450110:08:1:01 \O:19970817:002917:000037:0400:050020:3330:4015450120:08:1:01 Private \O:19970817:004050:000032:0400:050019:0330:4015450110:08:1:01 \O:19970817:004058:000025:0400:050020:3330:4015450120:08:1:01	Release 16

Table 18 - Test Reference M20BRI.1

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Make a 112k imux call from the CIU of the M20s 1T/8B to the M60 over a BRI trunk, then routed from the M60 to the network hub over a T1 trunk. (Port to Trunk call)	9(302) 547-1612 8(302) 547-1612
Public \O:19970821:045343:000048:010102:0110:4215479000 \O:19970821:045338:000053:010101:0110:4215471612 Private \O:19970821:045822:000007:010102:0110:4215479000 \O:19970821:045816:000014:010101:0110:4215471612	Release 14
Public \O:19970807:021352:000100:0400:010102:0110:4215479000:08:1:01	Release 16

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<code>`O:19970807:021347:000105:0400:010101:0110:4215471612:08:1:01</code> Private	
<code>`O:19970807:021755:000017:0400:010102:0110:4215479000:08:1:01</code>	
<code>`O:19970807:021749:000023:0400:010101:0110:4215471612:08:1:01</code>	

Table 19 - Test Reference M20BRI.2

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Make a 256k imux call from the CIU of the M20s 1T/8B via BRI to the QRVX in the M60. (Port to Port call)	8(303) 546-0212 (Imux)
No output (CDR not supported for port to port before Release 16)	Release 14
<code>`I:19970807:022252:000106:XXXX:XXXXXX:0110:8000:08:1:01</code> <code>`I:19970807:022252:000107:XXXX:XXXXXX:0110:8000:08:1:01</code> <code>`I:19970807:022252:000107:XXXX:XXXXXX:0110:8000:08:1:01</code> <code>`I:19970807:022249:000110:XXXX:XXXXXX:0110:0212:08:1:01</code>	Release 16

Table 20 - Test Reference M20BRI.3

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Make a 1x non imux call from the CIU of the M20s 1T/8B to the QRVX in the M60 over a BRI trunk. (Port to Port call)	9(303) 546-0220 (Non Imux) 8(303) 546-0220 (Non Imux)
No output (CDR not supported for port to port before Release 16)	Release 14
Public <code>`I:19970807:022952:000034:0201:040001:0110:0220:08:1:01</code> Private <code>`I:19970807:023049:000215:0201:040001:0110:0220:08:1:01</code> <code>`I:19970807:023316:000010:0201:040001:0110:0220:08:1:01</code>	Release 16

Table 21 - Test Reference M20BRI.4

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Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Make a 1x non imux call from the CIU of the M20s 1T/8B to the M60 over the BRI trunk, then routed to the network hub over a PRI trunk. (Port to Trunk call)	9(305) 547-1610 8(305) 547-1610
Public `O:19970821:053300:000008:010023:0110:4315471610 Private `O:19970821:053551:000005:010023:0110:4315471610	Release 14
Public `O:19970807:024015:000023:0400:010023:0110:4315471610:08:1:01 Private `O:19970807:024259:000015:0400:010023:0110:4315471610:08:1:01	Release 16

Table 22 - Test Reference M20BRI.5

5.4 CDR Billing Feature Test Scenario for M60

All calls incoming from a local codec attached by V.35/RS.449 (to QRVX card) or a local BRI connected codec, out to the network or another local codec.

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Make a 6x multirate call from the QRVX in the M60 to another QRVX port in the M60. (Port to Port call)	9546-0220 8546-0220
No test, Multirate calls not supported before Release 16.	Release 14
Private `I:19970808:014358:000008:0201:020001:0210:0220:08:5:06 `I:19970808:014439:000013:0201:020001:0210:0220:08:5:06 Public `I:19970808:014734:000008:0201:020001:0210:0220:08:5:06	Release 16

Table 23 - Test Reference M60.1

AccessWare and Call Detail Recording

Test scenario and CDR Billing Output	Phone number dialled, CDR record comments
Make a H0 call from QRVX port to QRVX port in the M60. (Port to Port call)	9546-0220 (Non Imux) 8546-0220 (Non Imux)
No output (CDR not supported for port to port before Release 16)	Release 14
Public `I:19970808:015401:000007:0201:020041:0210:0220:08:2:06 Private `I:19970808:015148:000009:0201:020041:0210:0220:08:2:06	Release 16

Table 24 - Test Reference M60.2

Test scenario and CDR Billing Output	Phone number dialled, CDR record comments
Make a 1x 56k non imux call from the QRVX in the M60 to the network hub over aT1 trunk. (Port to Trunk call)	9(421) 547-1610 (T1)
No output (CDR not supported for port to port before Release 16)	Release 14
`O:19970808:013620:000006:0200:010101:0210:4215471610:08:1:01	Release 16

Table 25 - Test Reference M60.3

Test scenario and CDR Billing Output	Phone number dialled, CDR record comments
Make 2x imux call from the QRVX in the M60 to the network hub over BRI, PRI, and E1 trunks. (Imux Port to Trunk calls)	9(431) 547-1612 (PRI) 9(412) 547-1612 (E1) 9(441) 547-1612 (BRI) 8(431) 547-1612 (PRI) 8(412) 547-1612 (E1) 8(441) 547-1612 (BRI)

AccessWare and Call Detail Recording

Test scenario and CDR Billing Output	Phone number dialled, CDR record comments
<p>PRI Public `O:19970821:062254:000011:010022:0210:4315479000 `O:19970821:062254:000011:010023:0210:4315471612</p> <p>E1 Public `O:19970821:062522:000004:030018:0210:4125479000 `O:19970821:062521:000005:030031:0210:4125471612</p> <p>BRI Public `O:19970821:062717:000008:040502:0210:4415479000 `O:19970821:062714:000011:040501:0210:4415471612</p> <p>PRI Private `O:19970821:062945:000010:010022:0210:4315478000 `O:19970821:062945:000011:010023:0210:4315471612</p> <p>E1 Private `O:19970821:063146:000005:030018:0210:4125478000 `O:19970821:063145:000006:030031:0210:4125471612</p> <p>BRI Private `O:19970821:063334:000004:040502:0210:4415478000 `O:19970821:063332:000007:040501:0210:4415471612</p>	<p>Release 14</p>
<p>PRI Public `O:19970815:072953:000005:0200:010022:0210:4315479000:08:1:01 `O:19970815:072953:000006:0200:010023:0210:4315471612:08:1:01</p> <p>E1 Public `O:19970815:073104:000007:0200:030018:0210:4125479000:08:1:01 `O:19970815:073103:000008:0200:030031:0210:4125471612:08:1:01</p> <p>BRI Public `O:19970815:072838:000002:0200:040502:0210:4415479000:08:1:01 `O:19970815:072835:000005:0200:040501:0210:4415471612:08:1:01</p> <p>PRI Private `O:19970815:072452:000002:0200:010022:0210:4315478000:08:1:01 `O:19970815:072451:000003:0200:010023:0210:4315471612:08:1:01</p> <p>E1 Private `O:19970815:072556:000003:0200:030018:0210:4125478000:08:1:01 `O:19970815:072556:000004:0200:030031:0210:4125471612:08:1:01</p> <p>BRI Private `O:19970815:072838:000002:0200:040502:0210:4415479000:08:1:01 `O:19970815:072835:000005:0200:040501:0210:4415471612:08:1:01</p>	<p>Release 16</p>

Table 26 - Test Reference M60.4

AccessWare and Call Detail Recording

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Setup and tear down multiple imux calls from the QRVX in the M60 to the network hub connected over PRI, T1, E1, and BRI. (Imux Port to Trunk calls)	9(431) 547-1632 (PRI) 9(412) 547-1632 (E1) 9(421) 547-1632 (T1) 9(441) 547-1632 (BRI)
PRI `O:19970821:064310:000006:010018:0210:4315479000 `O:19970821:064309:000007:010019:0210:4315479000 `O:19970821:064309:000007:010020:0210:4315479000 `O:19970821:064309:000008:010021:0210:4315479000 `O:19970821:064309:000008:010022:0210:4315479000 `O:19970821:064308:000009:010023:0210:4315471632 E1 `O:19970821:064603:000026:030013:0210:4125479000 `O:19970821:064603:000027:030014:0210:4125479000 `O:19970821:064603:000027:030015:0210:4125479000 `O:19970821:064602:000027:030017:0210:4125479000 `O:19970821:064602:000028:030018:0210:4125479000 `O:19970821:064601:000029:030031:0210:4125471632 T1 `O:19970821:064835:000004:010102:0210:4215479000 `O:19970821:064830:000008:010101:0210:4215471632 BRI `O:19970821:065034:000003:040502:0210:4415479000 `O:19970821:065031:000006:040501:0210:4415471632	Release 14
PRI `O:19970815:073511:000005:0200:010022:0210:4315479000:08:1:01 `O:19970815:073510:000006:0200:010023:0210:4315471632:08:1:01 `O:19970815:073521:000002:0200:010022:0210:4315479000:08:1:01 `O:19970815:073520:000003:0200:010023:0210:4315471632:08:1:01 `O:19970815:073527:000002:0200:010022:0210:4315479000:08:1:01 `O:19970815:073527:000003:0200:010023:0210:4315471632:08:1:01 E1 `O:19970815:073617:000006:0200:030018:0210:4125479000:08:1:01 `O:19970815:073617:000007:0200:030031:0210:4125471632:08:1:01 `O:19970815:073629:000003:0200:030018:0210:4125479000:08:1:01 `O:19970815:073628:000004:0200:030031:0210:4125471632:08:1:01 `O:19970815:073637:000002:0200:030018:0210:4125479000:08:1:01 `O:19970815:073636:000003:0200:030031:0210:4125471632:08:1:01 T1	Release 16

AccessWare and Call Detail Recording

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
<pre> \O:19970815:073750:000003:0200:010104:0210:4215479000:08:1:01 \O:19970815:073750:000004:0200:010103:0210:4215479000:08:1:01 \O:19970815:073750:000004:0200:010102:0210:4215479000:08:1:01 \O:19970815:073745:000009:0200:010101:0210:4215471632:08:1:01 \O:19970815:073811:000005:0200:010104:0210:4215479000:08:1:01 \O:19970815:073811:000005:0200:010103:0210:4215479000:08:1:01 \O:19970815:073811:000005:0200:010102:0210:4215479000:08:1:01 \O:19970815:073806:000010:0200:010101:0210:4215471632:08:1:01 \O:19970815:073834:000002:0200:010102:0210:4215479000:08:1:01 \O:19970815:073829:000007:0200:010101:0210:4215471632:08:1:01 \O:19970815:073854:000002:0200:010106:0210:4215479000:08:1:01 \O:19970815:073854:000003:0200:010105:0210:4215479000:08:1:01 \O:19970815:073854:000003:0200:010104:0210:4215479000:08:1:01 \O:19970815:073853:000004:0200:010103:0210:4215479000:08:1:01 \O:19970815:073853:000004:0200:010102:0210:4215479000:08:1:01 \O:19970815:073849:000009:0200:010101:0210:4215471632:08:1:01 BRI \O:19970815:074051:000005:0200:040702:0210:4415479000:08:1:01 \O:19970815:074051:000005:0200:040701:0210:4415479000:08:1:01 \O:19970815:074051:000006:0200:040502:0210:4415479000:08:1:01 \O:19970815:074048:000009:0200:040501:0210:4415471632:08:1:01 \O:19970815:074109:000002:0200:040701:0210:4415479000:08:1:01 \O:19970815:074108:000003:0200:040502:0210:4415479000:08:1:01 \O:19970815:074106:000006:0200:040501:0210:4415471632:08:1:01 \O:19970815:074123:000002:0200:040502:0210:4415479000:08:1:01 \O:19970815:074120:000004:0200:040501:0210:4415471632:08:1:01 \O:19970815:074136:000003:0200:040702:0210:4415479000:08:1:01 \O:19970815:074136:000003:0200:040701:0210:4415479000:08:1:01 \O:19970815:074136:000004:0200:040502:0210:4415479000:08:1:01 \O:19970815:074133:000007:0200:040501:0210:4415471632:08:1:01 </pre>	

Table 27 - Test Reference M60.5

AccessWare and Call Detail Recording

Test scenario and CDR Billing Output	Phone number dialled, CDR record comments
Setup and tear down multiple non imux calls from the QRVX in the M60 to the network hub connected over PRI, T1, E1 and BRI (Port to Trunk calls)	8(412) 547-1620 (E1) 8(421) 547-1620 (T1) 8(431) 547-1630 (PRI) 8(441) 547-1610 (BRI)
E1 `O:19970821:071834:000008:030041:0210:4125471620 T1 `O:19970821:072152:000006:010101:0210:4215471620 PRI `O:19970821:072426:000009:010043:0210:4315471630 BRI `O:19970821:072654:000007:040501:0210:4415471610	Release 14
E1 `O:19970815:074307:000004:0200:030031:0210:4125471620:08:1:01 `O:19970815:074321:000002:0200:030031:0210:4125471620:08:1:01 `O:19970815:074330:000002:0200:030041:0210:4125471620:08:2:06 T1 `O:19970815:074524:000001:0200:010101:0210:4215471620:08:1:01 `O:19970815:074533:000001:0200:010101:0210:4215471620:08:1:01 `O:19970815:074549:000002:0200:010101:0210:4215471620:08:1:01 `O:19970815:074556:000011:0200:010101:0210:4215471620:08:1:01 PRI `O:19970815:074651:000002:0200:010043:0210:4315471620:08:2:06 `O:19970815:074701:000002:0200:010023:0210:4315471620:08:1:01 `O:19970815:074711:000002:0200:010051:0210:4315471620:08:3:23 `O:19970815:074717:000002:0200:010023:0210:4315471620:08:1:01 BRI `O:19970815:074757:000004:0200:040501:0210:4415471620:08:1:01 `O:19970815:074811:000001:0200:040501:0210:4415471620:08:1:01 `O:19970815:074839:000002:0200:040501:0210:4415471620:08:1:01 `O:19970815:074849:000002:0200:040501:0210:4415471620:08:1:01 `O:19970815:074857:000002:0200:040501:0210:4415471620:08:1:01	Release 16

Table 28 - Test Reference M60.6

AccessWare and Call Detail Recording

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Ascend 3xBRI (6xIMUX), Call incoming from Trunk to the BRI Ports to the codec.	
Not tested.	Release 14
<pre> ^I:19970901:235136:000042:1600:190001:5011510:1610:08:1:01 ^I:19970901:235132:000046:1603:190020:5011510:1630:08:1:01 ^I:19970901:235134:000045:1601:190022:5011510:1620:08:1:01 ^I:19970901:235135:000043:1601:190023:5011510:1620:08:1:01 ^I:19970901:235133:000046:1603:190021:5011510:1630:08:1:01 ^I:19970901:235131:000048:1600:190019:5011510:1610:08:1:01 </pre>	<p>Release 16</p> <p>Note that the Ascend sends back pooled DN's but they are the DN's provisioned on AccessSwitch BRI ports, this makes CDR record parsing of Imux calls more difficult. Notice the last incoming call in bold, this was the first call made, the remaining 5 are the remaining DN's to complete the 2nd Port #1 call, 2 DN's for the Port #2 calls and the 2 DN's for the Port #4 calls. All other information is valid.</p>

Table 29 - Test Reference M60.7

AccessWare and Call Detail Recording

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Dual call from Sony Codec (BRI Port) over a PRI trunk to the Intel Proshare on the M20s 1T/8B (Port to Trunk Call)	9(403)544-0330 (Non-Imux) 9(403)544-3330 (Non-Imux)
`O:19970822:002609:000116:050320:0430:4035443330 `O:19970822:002600:000125:050319:0430:4035440330	Release 14
`O:19970817:001407:000031:0402:050320:0430:4035443330:08:1:01 `O:19970817:001358:000040:0402:050319:0430:4035440330:08:1:01	Release 16

Table 30 - Test Reference M60.8

5.5 CDR Billing Feature Test Scenario's for Network Hub

All calls incoming from network (simulated by another AccessSwitch) over T1 trunk. Calling Party Identifier information is not passed over T1 trunk and is not available in the CDR output.

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Make a 56k 1x non imux from the QRVX in the network hub over a T1 trunk to the QRVX in the M60. (Trunk to Port call)	9(601) 546-0210 (Non Imux)
`I:19970821:073200:000008:010101::0210	Release 14
`I:19970808:050933:000008:0200:010101::0210:08:1:01	Release 16

Table 31 - Test Reference NET.1

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Make a 56k imux call from the QRVX in the network to the M60 over a T1 trunk, then route the call over a PRI trunk to the M20s 3T/4P and connect the call to the SAIU. (Trunk to Trunk call)	9(602) 545-0112 (Imux)
`O:19970821:074616:000003:050001::4015459000 `O:19970821:074616:000004:050023::4015459000 `O:19970821:074616:000004:050022::4015459000 `O:19970821:074616:000004:050021::4015459000 `O:19970821:074616:000005:050020::4015459000	Release 14

AccessWare and Call Detail Recording

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
`O:19970821:074612:000008:050019::4015450112	
`O:19970808:052428:000009:0101:050001::4015459000:08:1:01	Release 16
`O:19970808:052428:000009:0101:050023::4015459000:08:1:01	
`O:19970808:052428:000009:0101:050022::4015459000:08:1:01	
`O:19970808:052428:000010:0101:050021::4015459000:08:1:01	
`O:19970808:052428:000010:0101:050020::4015459000:08:1:01	
`O:19970808:052424:000013:0101:050019::4015450112:08:1:01	

Table 32 - Test Reference NET.2

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Make a 2x 56k imux call from the QRVX on the network hub to the M60 over a T1 trunk, Then route the call from the M60 to the M20s 1T/8B over a PRI trunk and connect the call to the SAIU port. (Trunk to Trunk call)	9(603) 544-0112 (Imux)
`O:19970821:075118:000005:050320::4035449000	Release 14
`O:19970821:075115:000008:050319::4035440112	
`O:19970808:053251:000008:0101:050320::4035449000:08:1:01	Release 16
`O:19970808:053248:000011:0101:050319::4035440112:08:1:01	

Table 33 - Test Reference NET.3

5.6 EKTS Call Forward Test Configuration

See Figure 3 for details of test configuration.

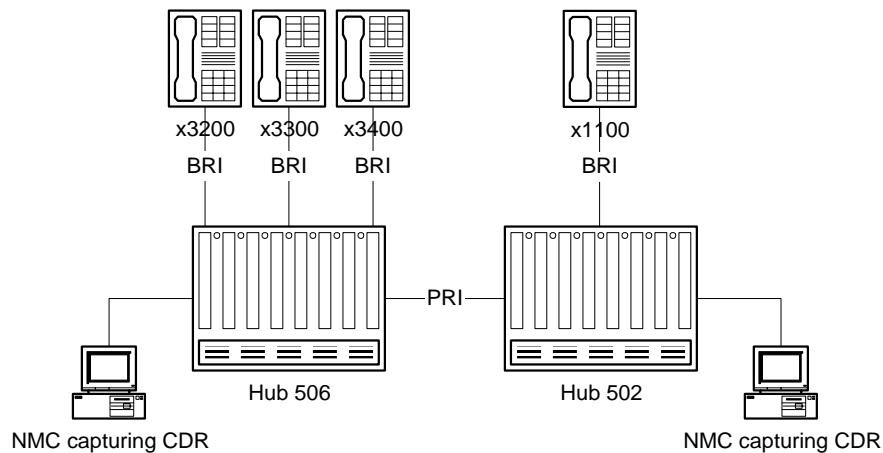


Figure 3 - Release 16 EKTS Call Forward Test Configuration

AccessWare and Call Detail Recording

Note that each test was repeated with the forwarding phone set up to:

- Call Forward Unconditional
- Call Forward Busy
- Call Forward No Answer

The trace does not vary between each forwarding type, so the repeated trace is not shown.

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Hub 506: Ext 3400 calls Ext 3200, which is set up to Call forward to Ext 3300	3200
`I:19970904:141555:000006:0502:050301:3400:3300:00:1:01	Release 16

Table 34 - Test Reference FWD.1

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Hub 506: Ext 3400 calls Ext 3200, which is set up to Call forward to Ext 3300	5063200
`I:19970904:141836:000004:0502:050301:3400:3300:00:1:01	Release 16

Table 35 - Test Reference FWD.2

Test scenario and CDR Billing Output	Phone number dialed, CDR record comments
Hub 506: Ext 3400 calls Ext 3200, which is set up to Call forward to Hub 502, Ext 1100	3200
Hub 506 `O:19970904:141940:000007:0503:010019:3400:3015021100:00:1:01	Release 16
Hub 502 `I:19970904:141940:000007:1600:190019:5063400:1100:00:1:01	

Table 36 - Test Reference FWD.3