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SINGLE LINE REMOTE CALL FORWARDING AND INTEROFFICE MULTIPLE CALL FEATURE DOCUMENT

1A ESSÔ SWITCH

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1. INTRODUCTION

DEFINITION

1.01 The SLRCF (Single Line Remote Call Forwarding) and IMCF (Inter-office Multiple Call Forwarding) features are separate custom features that provide unique call forwarding capabilities for POTS (Plain Old Telephone Service) lines as follows:

(a) The SLRCF feature allows a POTS line to have RCF (Remote Call Forwarding) service without requiring a SFG (simulated facility group) and asso- ciated limited access SFRs (simulated facility registers).

(b) The IMCF feature allows a POTS line to have more than one call at a time forwarded to a remote DN (directory number) served by another switch. The remote DN must be capable of handling multiple calls.

ECONOMIC WORTH

1.02 The SLRCF and IMCF features improve existing RCF and interoffice call forwarding capabilities and conserve system resources. In addition to improved service capabilities and customer satisfaction, these features can generate additional revenue for the telephone company.

1.03 The SLRCF and F features are designed to conserve system resources that would otherwise be required for similar customer services. These features can be used to help alleviate a shortage of SFGs, SFRs, and TPT (temporary transfer) registers in a 1A ESS switch.

A. Single Line Remote Call Forwarding

1.04 The SLRCF feature provides RCF service for POTS lines without requiring SFGs and associated limited access SFRs. Without the SLRCF feature, RCF service is provided by the RCF feature, which requires SFGs and associated limited access SFRs. For detailed information regarding the RCF feature, see reference A(1)in Part 6.

1.05 Without the SLRCF feature, the number of RCF customers served by a 1A ESS switch is limited to the number of SFGs and associated limited access

SFRs that can be provided in a 1A ESS switch. Since the SLRCF feature eliminates the need for SFGs and associated limited access SFRs for RCF customers, more customers can be provided RCF service. Additional RCF customers can generate additional revenue for the telephone company.

B. lnteroffice Multiple Call Forwarding

1.06 The IMCF feature allows a POTS line to have multiple calls forwarded to a remote DN served by another switch. The IMCF capability is based on a reduced holding time of TPT registers. The TPT registers are also referred to as "call forwarding" registers. A TPT register is required for each call that is forwarded via either SLRCF, CFV (Call Forwarding Variable), or CFUP (Call Forwarding Usage Sensitive) to a remote DN served by another switch. Without the IMCF feature, a TPT register is held for the duration of a forwarded call. In this case, a POTS line can have only one call at a time forwarded to a remote DN served by another switch. With the IMCF feature, a TPT register is released after an answer signal is received from the other switch. This allows another call to be forwarded after the previous call has been answered.

Note: For detailed information regarding CFV and CFUP, see references A(2) and A(3) in Part 6.

1.07 Since the IMCF feature significantly reduces the holding time of TPT registers, the number of TPT registers required in a educed. The reduced TPT register holding time also increases the call completion rate and reduces the number of call retries for calls that are forwarded to another switch. Increased call completion of forwarded calls can result in additional revenue for the telephone company.

AVAILABILITY

1.08 The SLRCF and IMCF features are available in 1AE8A.10 and later PPUs (periodic partial updates), 1AE9.06 and later PPUs, and 1AE10.01 and later PPUs.

FEATURE GROUPS

1.09 No feature groups are required for the SLRCF and IMCF custom features.

FEATURE ASSIGNMENT

1.10 The SLRCF and IMCF features are separate custom features that are activated independently on a per-switch basis.

2. USER PERSPECTIVE

USER PROFILE

2.01 The SLRCF feature is designed for POTS customers who require RCF service. The IMCF feature is designed for POTS customers who use either SLRCF, CFV, or CFUP to forward calls to a remote DN served by another switch.

2.02 In order for multiple calls to be forwarded to a remote DN, the remote DN must be capable of handling multiple calls. A remote DN can be assigned a feature such as multiline hunting or series completion to provide multiple call handling capabilities. Otherwise, multiple calls cannot be forwarded to the remote DN since the remote DN can handle only one call at a time. For detailed information regarding multiline hunting and series completion, see references A(4) and A(5) in Part 6,

CUSTOMER PREMISES EQUIPMENT

2.03 No special or unique CPE (customer premises equipment) is required for either the SLRCF feature or the IMCF feature.

FEATURE DESCRIPTION

A. Single Line Remote Call Forwarding

2.04 With SLRCF, a call to a base DN is automatically forwarded to a remote DN that is preassigned for that base DN. The remote DN can be served by the same switch that serves the base DN or the remote

DN can be served by another switch.

2.05 The SLRCF feature operation is identical to the CFV feature operation except the remote DN is preassigned (via standard serrvice order procedures), no customer dialed activation or deactivation is required, and no ring reminder is provided for the base DN when a call is forwarded. The SLRCF feature has the same intraoffice and interoffice call forwarding capabilities as the CFV feature. When a call is made to a base DN, an attempt is automatically made to forward the call to the preassigned remote DN.

2.06 If the remote DN is served by the same switch that serves the base DN, only one call at a time can be forwarded to the remote DN unless the remote DN can handle multiple calls. When a call is made to the base DN, the call is automatically forwarded to the remote DN if the remote DN is idle. If the remote DN is busy, the call to the base DN is provided busy treatment. If the remote DN is assigned a feature such as multiline hunting or series completion, multiple calls can be forwarded to the remote DN. In this case, a call to the base DN is provided busy treatment only when all stations in either a multiline hunt group or series completion group are busy.

2.07 If the remote DN is served by another switch, a TPT register is required to forward a call to the remote DN. Only one TPT register can be allocated for a base DN at one time. Since a TPT register is utilized for the duration of a forwarded call, only one call at a time can be forwarded to a remote DN served by another switch. When a call is made to a base DN, an attempt is made to seize and allocate a TPT register for the base DN. After a TPT is allocated for a call, the call is automatically forwarded to the remote DN. Subsequent calls to that base DN are provided busy treatment until the call is disconnected and the TPT register is released.

Note: The F feature interacts with the SLRCF feature. If IMCF is provided in a switch, multiple call forwarding is possible for calls forwarded via SLRCF to remote DNs served by other switches.

B. Interoffice Multiple Call Forwarding

2.08 With F, more than one call at a time can be forwarded to a remote DN served by another switch. The F feature interacts automatically with the SLRCF, CFV, and CFUP features. For detailed information regarding the CFV and CFUP features, see references A(2) and A(3) in Part 6.

2.09 A TPT register is required for each call forwarded via either SLRCF, CFV, or CFUP to a remote DN served by another switch. A base DN can have only one TPT register allocated at a time. Without the IMCF feature, a TPT register is held for the entire duration of a forwarded call. The F feature significantly reduces the holding time of TPT registers. With the IMCF feature, a TPT register is held until an answer signal is received from the other switch. When an answer signal is received, the TPT register is released and made available for another call.

2.10 IMCF capability is based on there lease of a TPT register when a call is answered rather than holding the register for the entire call duration. When a call is made to a base DN that requires a TPT register, a check is made to determine whether or not a TPT register is already allocated for a call to that base DN. If not, a TPT register is allocated and the call is automatically forwarded to the remote DN. After a TPT register is allocated, any subsequent calls to that base DN receive busy treatment until the TPT register is released. The TPT register is released from the call after either answer or abandon occurs. This allows a TPT register to be allocated for a subsequent call to the base DN.

2.11 Since a base Dn can have only one TPT register allocated at a time, a base DN is limited to one unanswered call at a time.

Note: The number of completed calls to a remote DN that can exist at one time is limited only by the call handling capabilities provided for the remote DN.

INTERACTIONS

2.12 The SLRCF and IMCF features interact as described in this document.

2.13 With SLRCF, the forwarded leg of a call may require voice switch gain amplification that is provided by tlie RSTC (Routing-Selected Transmission Control) feature. For detailed information regarding the RSTC feature, see reference A(6) in Part 6.

2.14 The IMCF feature significantly reduces the holding time of TPT registers and provides multiple call forwarding capabilities for the SLRCF, CFV, and CFUP features as described in this document. For detailed information regarding the CFV and CFUP features, sctse references A(2) and A(3) in Part 6.

OPERATIONAL LIMITATIONS

2.15 The SLRCF feature operational limitations with- out the IMCF feature are as follows:

(a) Only one call at a time can be forwarded to a remote DN served by the same switch that serves the base DN unless the remote DN is assigned a feature (e.g., multiline hunting or series completion) that allows the remote DN to handle multiple calls. In this case, the number of calls that can be forwarded at one time to a remote DN is

limited by the call handling capabilities provided for the remote DN.

(b) Only one call at a time can be forwarded to a remote DN served by another switch.

2.16 The IMCF operational limitations applicable to the SLRCF, CFV, and

CFUP features are as follows:

(a) A base DN is limited to one unanswered call at a time to a remote DN served by another switch.

(b) The maximum number of calls that can be forwarded at one time to a remote DN served by another switch is limited only by the call handling capabilities provided for the remote DN.

3. ENGINEERING

3.01 These guidlines are for planning purposes only. The COEES (Central Office Equipment Engineering System) Information System engineering document, Index 70, should be used to manually order and engineer the 1A ESS switch. The stabdard recom mended automated procedure is COEES-MO (Mechanized Ordering).

HARDWARE

3.02 No new or unique hardware is required for either the SLRCF feature or the IMCF feature.

SOFTWARE

A. Base Generic Program

3.03 The SLRCF and IMCF features require approximately 50 words in the base generic program regardless of whether or not these features are activated.

B. Parameters/CallStoreAreas

3.04 The SLRCF feature is a custom feature that is activated using set card FFO43 to set a bit in a parameter word.

3.05 The IMCF feature is a custom feature that is activated using set card FFO44 to set a bit in a parameter word.

3.06 The number of 17-word TPT registers required in an office is affected by the SLRCF and IMCF features. Additional TPT registers are required if the SLRCF feature is activated without the IMCF feature. If the IMCF feature is activated, the total number of TPT registers required in an office is reduced.

3.07 The number of TPT registers required in an office depends on the usage, which can be estimated as follows:

If SLRCF is activated without IMCF, estimate the total CCS using the formula:

Total CCS = Projected CCS + (B*C) * .01

If IMCF is activated, estimate the total CCS using the formula:

Total CCS = Projected CCS - -D)) + ((A*(CD))+(B*D)) * .01

where:

A = Projected number of interoffice CFV and CFUP calls.

B = Projected number of interoffice SLRCF calls.

C = Holding time of interoffice CFV, CFUP, and SLRCF calls without IMCF (default - 180 seconds).

D = Holding time of interoffice CFV, CFUP, and SLRCF calls with IMCF (default = 20 seconds).

3.08 The total number of TPT registers specified for an office by set card NTR can be estimated using the formula:

NTR = P.001 (HD/ABS peak factor for TPT register usage, ABSBH, total ABSBH CCS calculated above).

Note: For detailed parameter, call store, and set card information, see references B(1), B(2), and B(3) in Part 6.

C. Translations

3.09 A 6-word RCF DN auxiliary block is required for each line that is assigned the SLRCF feature.

Note: If an existing RCF customer converts to the SLRCF feature, the existing RCF DN auxiliary block is used for the SLRCF feature. For detailed translation information, see references B(4) and B(5) in Part 6.

REAL TIME

3.10 The real time impact of the SLRCF and IMCF features is negligible.

4. IMPLEMENTATION

FEATURE ACTIVATION

4.01 The SLRCF feature is activated in a switch by a parameter update with set card FFO43 set to a value of 1.

4.02 The IMCF feature is activated in a switch by a parameter update with set card FFO44 set to a value of 1.

FEATURE ASSIGNMENT

4.03 The SLRCF feature is available for POTS lines only and is assigned on a per-line basis via standard service order procedures.

4.04 The IMCF feature is not an assignable feature. When activated, the IMCF feature automatically interacts with SLRCF, CFV, and CFUP forwarded calls that use TPT registers as described in this document.

SET CARDS

4.05 In addition to the custom feature set cards FFO43 (for SLRCF) and FFO44 (for IMCF), set card NTR is required to specify the number

of TPT registers required in a switch. Refer to Part 3 for engineering information regarding set card NTR.

Note: Set card NSF maybe affected if existing customers who have the RCF feature with SFGs convert to the SLRCF feature. Set card NSF specifies the number of limited access SFRs required in a switch. For detailed information regarding the RCF feature, see reference A(1) in Part 6. For detailed set card, parameter, and call store information, see references B(1), B(2), and B(3) in Part 6.

TRANSLATION FORMS

4.06 Translation forms applicable to POTS lines that are assigned the SLRCF feature are as follows:

- o 1101-Directory Number Record
- o 1107-Supplementary Information Record
- o 1306-Line Class Code Record.

Note: The entries required on these forms for the SLRCF feature are the same entries that are required for the RCF feature. For detailed information regarding translation forms, see reference B(4) in Part 6.

RECENT CHANGE MESSAGES

4.07 The RC:LINE recent change message is used to assign, change, and remove translation data for POTS lines. The RC:LINE recent change messages and keywords applicable to the SLRCF feature are as follows:

(a) The RC:LINE: message keyword RCF aaabbbbbbb is used to assign the SLRCF feature and the 7- or 10-digit remote DN for a new customer line.

Note: This is the same message used to assign the RCF feature. Keyword SFG is not applicable since SFGs are not used for the SLRCF feature. A SLRCF customer base DN can be associated with either a LEN (line equipment number) or a pseudo-LEN.

(b) The RC:LINE;CHG: message keyword SFG NO is used to remove the SFG assigned for an existing customer line that has the RCF feature.

Note: This message is used for an existing RCF customer who desires to convert to the SLRCF feature. No other message is required for a customer to be converted ftom the RCF feature to the SLRCF feature since the translation data assigned by keyword RCF aaabbbbbbb already exists.

(c) The RC:LINE;CHG: message keyword RCF aaabbbbbbb is used either to assign the SLRCF feature and 7- or 10-digit remote DN for an existing line that does not have the SLRCF feature or to

change the remote DN assignment for an existing line that has the SLRCF feature.

(d) The RC:LINE;CHG: message keyword RCF NO removes the SLRCF feature and remote DN assignment for a line.

Note: For detailed line recent change information, see reference A(7) in Part 6.

VERIFICATION

4.08 The SLRCF feature assignment is verified using the VFY-DN-30 input message. A TRO1 output message contains the SLRCF assignment data.

Note: For detailed input and output message information, see references B(6) and B(7) in Part 6.

5. ADMINISTRATION

MEASUREMENTS

5.01 No special or unique measurements are applicable to the SLRCF and IMCF features. Standard traffic measurements are applicable to SLRCF calls.

Note: For detailed traffic measurement information, see reference A(8) in Part 6.

AUTOMATIC MESSAGE ACCOUNTING

5.02 No special or unique AMA (Automatic Message Accounting) records are generated for calls involving the SLRCF and F features. Standard AMA records are applicable to calls involving these features.

5.03 With the SLRCF feature, if a call to a base DN is billable, an AMA record is generated for the calling DN for that leg of the call. If the forwarded leg of a SLRCF forwarded call is billable, an AMA record is generated for the SLRCF base DN.

Note: For detailed AMA information, see references A(9) and in Part 6.

6. REFERENCES

6.01 The following documentation contains information related to or affected by the SLRCF and IMCF features.

A. AT&T Practices

(1) 231-090-312-Remote Call Forwarding

(2) 231 -090-074-Call Forwarding Variable

(3) 231-090-292-Call Forwarding Usage Sensitive

(4) 231-090-180-Multiline Groups-Hunting and Nonhunting Capabilities

(5) 231-090-179-Series Completion

(6) 231-090-146-Routing-Selected Transmission Control

(7) 231-318-325-Line Recent Change Formats

(8) 231-090-207-Traffic Measurements

(9) 231-390-063-Automatic Message Accounting (Single Entries)

(10) 231-390-069-Automatic Message Accounting Standard Entries and Multientry Teleprocessing System.

B. Other Documentation

(1) Parameter Guide

(2) Office Parameter Specification PA-6A00l

(3) Call Store Data Layout Manual PK-6A006

(4) Translation Guide TG-1A

(5) Translation Output Configuration PA-6A002

(6) Input Message Manual IM-6A001

(7) Output Message Manual OM-6A001.

7. COMMENT FORM

7.01 A comment form is located at the back of this practice to provide a communications channel user to the writer.

8. ISSUING ORGANIZATION

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