ARH6384

CONTROL DATA DISTRIBUTED COMMUNICATION NETWORK (CDCNET)

DIRECTORY M-E ERS

EXTERNAL REFERENCE SPECIFICATION

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RECORD OF REVISION

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A	Initial version	83/09/20
B	TDRB approved version	83/12/21
C	Third revision, 180 Enhancements	84/06/11

1.0 INTRODUCTION

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The Directory M-E provides a registration and translation service. A title and corresponding address are registered. A user can request a translation of the title and get the address. The Directory M-E does not validate the title or address.

1.2 PURPOSE

The purpose of Directory M-E is to

1) Register a title and corresponding address over a specified Translation domain. If requested, periodically distribute the title over a specified Distribution Domain.

2) Translate a title. Return one or more addresses for a matched title over a specified search domain. If the title cannot be translated, the translation service will continue searching for the title for a specified time.

1.3 REFERENCES

1. CDC Network Architecture GDS (ARH4243)

2. Xerox Internet Entity ERS by R. Woodruff (ARH6221)

3. Routing M-E ERS by N. L. Reddy (ARH6264)

4. Executive ERS BY F. J. BAKER (ARH4976)

5. CDCNET Program Interface Handbook by C. A. Rykken (ARHXXXX)

2.0 FEATURE/SERVICE OVERVIEW

2.1 FEATURES/SERVICES

The services offered by the Directory M-E are

1) Maintain a Registered User Data Store (RDS) which contains all the titles registered by users in this system. Any type of title may be registered, e.g, end-user names, filenames, M-E names, etc.

2) Maintain a Translation Data Store (TDS) which contains titles registered in remote systems which have been translated in this system. The Translation Data Store also contains those titles registered in remote systems which have been distributed to this system. The TDS contains entries for titles translated/received in the last hour. TDS entries older than one hour are purged. Also if the TDS entries exceed a limit, the least recently used entry will be purged. If two TDS entries have the same title and address, the most recently created entry is retained and the other entry is discarded.

3) Maintain a Translation Request Data Store (TRDS) which is used to process requests for translation by users in this system.

The layers and entities of the system are users of the Directory M-E.

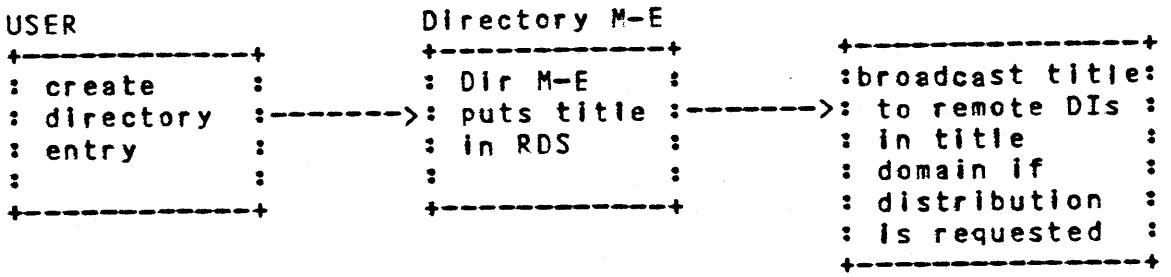
2.2 FUNCTIONAL RELATIONSHIPS

2.2.1 REGISTRATION FEATURE

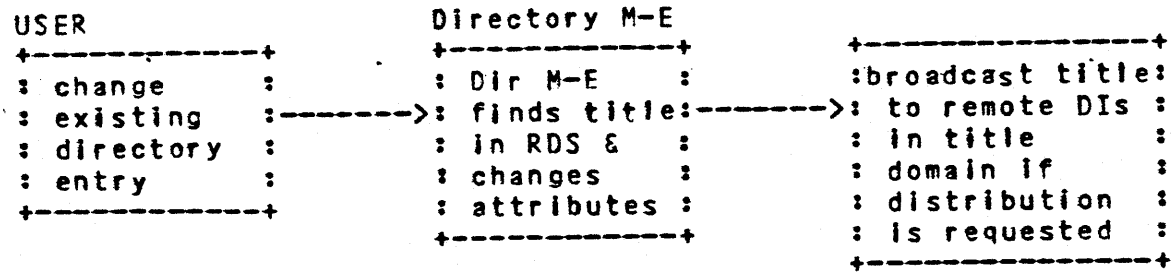
The user can create, change, or delete a directory entry. The interface is via CALL/RETURN. The following diagrams illustrate these features.

2.0 FEATURE/SERVICE OVERVIEW
2.2.1.1 Create Directory Entry

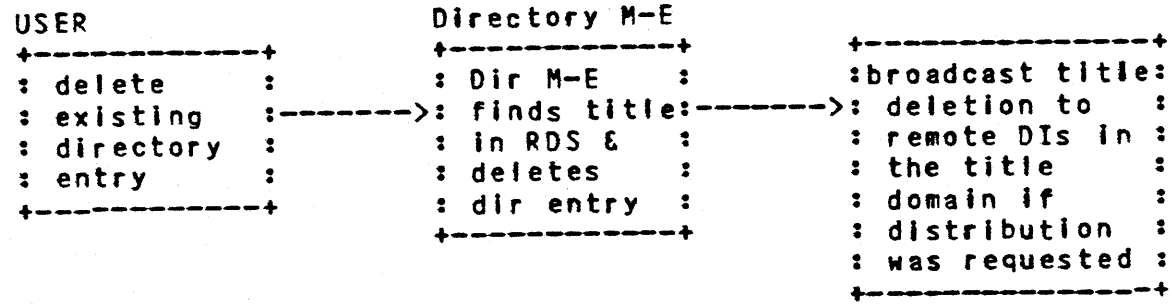
2.2.1.1 Create Directory Entry



2.2.1.2 Change Directory Entry



2.2.1.3 Delete Directory Entry



2.2.2 TRANSLATION FEATURE

The translation feature provides a means to obtain one or more addresses for a given title. The Translation Request is via a CALL/RETURN. The confirm/reject is at the RETURN of the call.

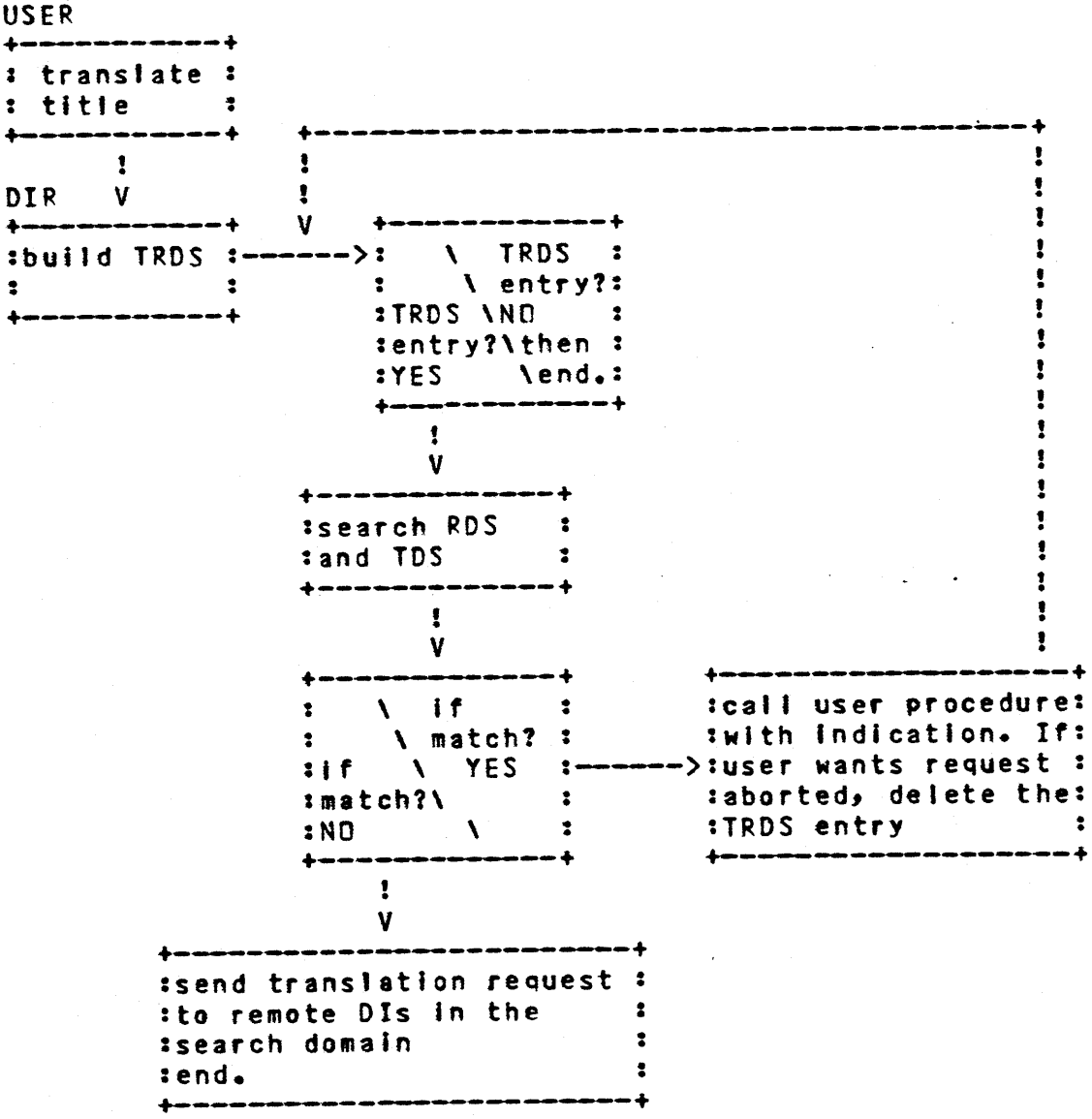
The Translation Indication is via a CALL/RETURN to a user procedure supplied in the Translation Request. The user may terminate the Translation Request at the RETURN of user procedure.

The user can specify two different types of search: active and passive. The active search actively requests titles from all the systems in the search domain. The user can specify a search time for the active search. The Directory M-E terminates the request when this time has depleted with a CALL/RETURN to the user procedure supplied in the Translation Request. The passive search waits for titles to be distributed periodically. There is no time limit for the passive search, that is, the user must explicitly abort a passive Translation Request.

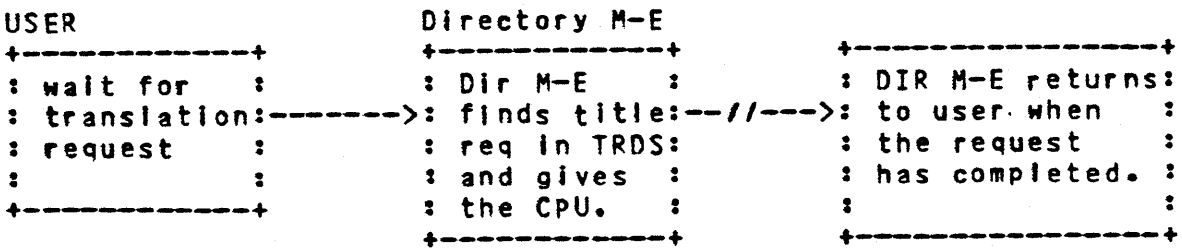
The user can wait for the Translation Request to complete with a CALL/RETURN. The Directory M-E returns to the user after the Translation Request has terminated. The user can also abort the Translation Request at any time with a CALL/RETURN.

A Purge Translation Entry Request is provided to enable the user to delete a Directory Entry from the Translation Data Store. Thus, the user will not get the same Directory Entry in a subsequent Translation Request unless that entry is still in the original system. Note, this can be used by the user when a connection to a title (service) fails and the user wants another title. The following diagrams illustrate the translation feature.

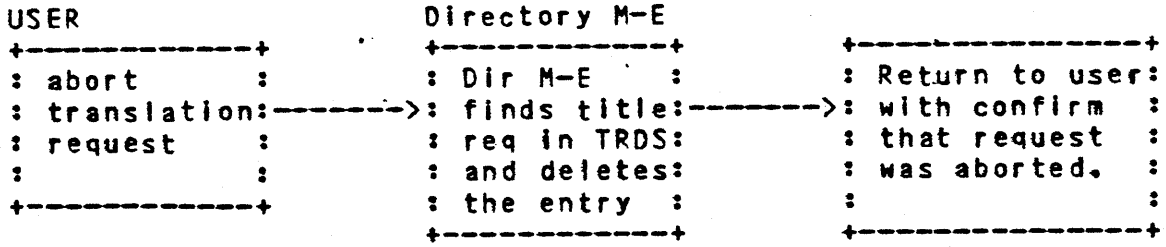
2.2.2.1 Translation Request



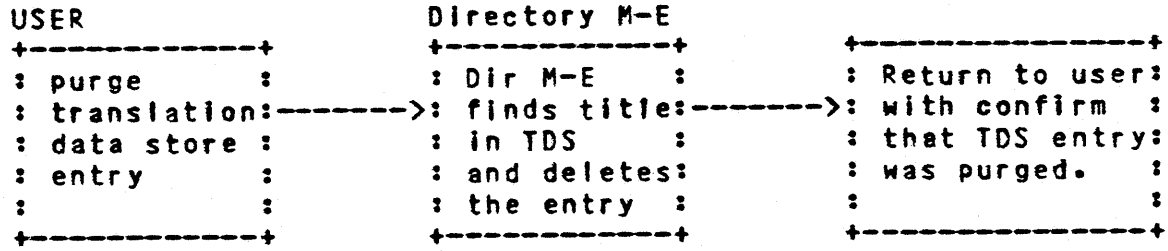
2.2.2.2 Wait_for_Translation_Request



2.2.2.3 Abort_Translation_Request



2.2.2.4 Purge_Translation_Entry_Request



2.3 UTILIZED EXTERNAL INTERFACES

The Directory M-E must communicate with remote Directory M-Es in order to satisfy title translation requests with search domains other than the local system. The Directory M-E must also distribute to remote Directory M-Es registered titles with a distribution domain other than the local system.

2.3.1 ROUTING M-E INTERFACE

In order to communicate with remote Directory M-Es, the Directory M-E must open a 3B-SAP. First, Directory waits for a translation of the "Sap Assigner" title and then it calls the returned procedure to open a 3B-SAP. A dedicated 3B-SAP title of "directory_sapid" is supplied. See the Routing ERS for a description of the calling parameters.

The Routing M-E must maintain the NETWORK_TITLE_ENTRY table which is a list of all network addresses and corresponding hop counts in the catenet. The Routing M-E must register all community titles received in Routing Information Data Units from remote Routing M-E's. The Directory M-E uses these network and community addresses to communicate to remote Directory M-E's.

2.3.2 INTERNET INTERFACE

The Directory M-E uses the Internet entity to send and receive PDUs from remote Directory M-Es. See XEROX Internet ERS for a description of the interface.

3.0 FEATURE DESCRIPTIONS

3.0 FEATURE DESCRIPTIONS

The Directory M-E supports registration and translation of directory entries. When titles are compared during registration or translation, the shorter title is padded with blanks to match the length of the longer title before the comparison is done.

3.1 REGISTRATION FEATURE

All layers and entities are candidates as users of the Registration feature. Users must include in their calling modules a *CALLC DRXDIR which defines the TYPE declarations and the XREF declarations for the Directory M-E procedures. It also defines the parameter attributes for these procedures.

3.1.1 INITIALIZE REGISTRATION CONTROL BLOCK

The registration routines all use the registration control block, DIR_RCB. An inline procedure is provided called DIR_RCB_INIT which initializes the control block to all defaults. The defaults are defined with the parameter descriptions in the Create Directory Entry section.

```
PROCEDURE [INLINE] dir_rcb_init (VAR dir_rcb: dir_rcb_rec);
```

3.1.2 CREATE DIRECTORY ENTRY

The user creates a directory entry in the Registered User Data Store (RDS) with a CALL/RETURN. If there is already an entry in RDS with the same title, service attribute, and address, an error will be returned.

```
PROCEDURE [XREF] dir_create (dir_rcb: dir_rcb_rec;
  VAR dir_id: dir_id_rec) dir_status_codes;
```

1) DIR_RCB — Directory registration control block. The record structure follows:

```
TYPE
  dir_rcb_rec = record
    title_ptr: ^string ( * <= max_title_len),
    service: dir_service,
    translation_domain: (local_system,
        list_of_communities, catenet),
    distribution_domain: (list_of_communities,
        catenet, none),
    community_ptr: ^array [ 1 .. * ] of
        string (max_community_len),
    password: <0 .. FFFFFFFF>,
    address: dir_address_rec,
    userinfo_ptr: ^string ( * <= max_userinfo_len),
    priority: <1 .. FF>,
    class: (cdna_internal,cdna_external),
  recend;
```

title_ptr — The pointer to the title string. The title is a string of 1 to 255 ASCII (Parity Bit = 0) characters. Max_title_len is 255 characters. This is the only required field in this control block.

service — A parameter that defines the highest layer end-to-end CDNA protocol to be used to communicate with this entry. Service is

defined as a ordinal. If the ordinal is zero, this entry has a directly accessible service value of unknown. Unknown is the default.

```
TYPE
  dir_service = (unknown, xerox_internet, xerox_transport,
    generic_transport, x25_support_layer,
    interactive_transfer_service);
```

translation_domain
: This parameter is used to identify where in the network the translation request can originate and be translated. Default is catenet. Note that a title registered with a Translation Domain of local_system cannot be obtained outside of the local system.

distribution_domain
: This parameter is used to identify where in the network the title is to be distributed after registration. Default is catenet. Note that the Distribution Domain must be a subset of the Translation Domain. Also, if a list_of_communities is specified for both domains, the list must be the same for both domains. Note, a distribution_domain must be specified if this title is intended for translation with a passive search type. See the Translation Request for details.

community_ptr
: This parameter is only used if Translation Domain and/or Distribution Domain is set to list_of_communities. Community_ptr is a pointer to an array of community titles. There can be up to 16 community titles. The community title is a string of 1 to 32 characters. Note, the "Community " prefix is not to be included in the title. Trailing blanks are deleted.

password
: The password to be associated with this directory entry. This value must be supplied on a Change or Delete request. Password is defined as an integer. Default is zero.

address
: The address record. Address is a variant record. The default address type is

system_addr. If the network ID field is zero, the network ID and system ID of the local system is stored in the address field by Directory M-E for address types system_addr, internet_addr, and transport_addr. The record structure for dir_address_rec follows:

```
TYPE
  dir_address_type = (system_addr, internet_addr,
    transport_addr, non_network_addr, record_addr, proc_addr);

TYPE
  system_address = record
    network_id: <0 .. FFFFFFFF>,
    system_id: <0 .. FFFFFFFFFFFF>,
  recend;

TYPE
  dir_address_rec = record
    case addr_type: dir_address_type of
    = system_addr =
      system: system_address,
    = internet_addr =
      internet: internet_address,
    = transport_addr =
      transport: generic_sap,
    = non_network_addr =
      addr_data: SEQ (REP 14 of cell),
    = record_addr =
      record_ptr: ^cell,
    = proc_addr =
      proc_ptr: ^procedure,
    casend
  recend;
```

userinfo_ptr — The pointer to the user information string. If userinfo_ptr is NIL, then there is no user information supplied. Max_userinfo_len is 32 characters.

priority — A number which specfies the relative priority of this entry as compared with other directory entries with the same title. By convention, 1 is the highest priority. Default is 1.

3.0 FEATURE DESCRIPTIONS
3.1.2 CREATE DIRECTORY ENTRY

class — An ordinal which identifies the originator of this title. The values are CDNA internal or CDNA external. Default is CDNA internal.

2) DIR_ID — Directory entry identifier. This parameter is returned if the create was successful. The directory entry identifier uniquely identifies this Directory Entry. It consists of the local system address and current decimal time. The record structure follows:

```
TYPE
  dir_id_rec = record
    system_addr: system_address,
    decclock: bcd_time,
  recend;
```

3) DIR_CREATE — Status is returned in the procedure name. Dir_create is set to dir_create_ok if this request is confirmed, otherwise, this CREATE request is rejected--

dir_status_codes	description
dir_create_ok	title added to directory
dir_no_room	no room for directory entry. Error returned from Allocate.
dir_title_err	title length not 1-255
dir_address_err	address record invalid
dir_userinfo_err	userinfo_len or userinfo_ptr out of range
dir_community_err	community pointer length out of range
dir_domain_err	distribution domain not subset of translation domain
dir_duplicate	existing entry with same title,address, and service attribute.

3.1.3 CHANGE DIRECTORY ENTRY

The user changes an existing directory entry in the Registered User Data Store (RDS) with a CALL/RETURN. The title, password, and directory entry identifier must match an existing entry in RDS. The user must supply a change set which specifies which parameters are to be affected.

```
PROCEDURE [XREF] dir_change (dir_rcb: dir_rcb_rec;
      dir_change_effectors: dir_change_set;
  VAR dir_id: dir_id_rec) dir_status_codes;
```

1) DIR_RCB — Directory registration control block. It has the same record structure as in dir_create. It is not possible to change a title and password with this call. The other parameters are changed in the existing directory entry if the change effector bit was set by the user.

2) DIR_CHANGE — A set which specifies the parameters which may be changed in the directory entry. The parameter change bit must be set for the change to occur.

```
TYPE
  dir_change_set = set of (address_change, userinfo_change,
    service_change, translation_domain_change,
    distribution_domain_change, community_change,
    priority_change);
```

3) DIR_ID — The current directory entry identifier. On a change, it must be supplied by the caller. The dir_id is updated to reflect the change and returned to the user in this parameter.

4) DIR_CHANGE — Status is returned in the procedure name. Dir_change is set to dir_change_ok if this request is confirmed, otherwise this CHANGE request is rejected--

dir_status_codes	description
dir_change_ok	title changed in directory
dir_entry_not_found	cannot find directory entry

dir_title_err	title length not 1-255
dir_address_err	address record invalid
dir_userinfo_err	userinfo_len or userinfo_ptr out of range
dir_domain_err	domain out of range
dir_community_err	community pointer length out of range

3.1.4 DELETE DIRECTORY ENTRY

The user deletes an existing directory entry in the Registered User Data Store (RDS) with a CALL/RETURN. The title, password, and directory entry identifier must match an existing RDS entry.

```
PROCEDURE [XREF] dir_delete (dir_rcb: dir_rcb_rec;
  VAR dir_id: dir_id_rec) dir_status_codes;
```

1) DIR_RCB — Directory registration control block. It has the same record structure as in dir_create. The only parameters processed by delete are the title pointer and the password. The other parameters are ignored.

2) DIR_ID — The current directory entry identifier. On a delete, it must be supplied by the caller.

3) DIR_DELETE — Status is returned in the procedure name. Dir_delete is set to dir_delete_ok if this request is confirmed, otherwise this DELETE request is rejected--

dir_status_codes	description
dir_delete_ok	title was deleted from the directory
dir_entry_not_found	cannot find directory entry
dir_title_err	title length not 1-255

3.2 TRANSLATION FEATURE

All layers and entities are candidates for users of the Translation feature. Users must include in their calling modules a *CALLC DRXDIR which defines the TYPE declarations and the XREF declarations for the Directory M-E procedures. It also defines the parameter attributes for these procedures.

3.2.1 INITIALIZE TRANSLATION CONTROL BLOCK

The translation routines use the translation request control block, DIR_TCB. An inline procedure is provided called DIR_TCB_INIT which initializes the control block to all defaults--

```
PROCEDURE [INLINE] dir_tcb_init (VAR dir_tcb: dir_tcb_rec);
```

3.2.2 TRANSLATE DIRECTORY TITLE

The user requests a title translation with a CALL. The RETURN notifies the user of a confirm/reject status of the translate request. The translation indication is via a CALL/RETURN to the procedure identified in the translate request control block (see the translation_if parameter).

```
PROCEDURE [XREF] dir_translate (dir_tcb: dir_tcb_rec;
  VAR dir_tid: dir_id_rec) dir_status_codes;
```

1) DIR_TCB — Directory translation request control block. The record structure follows:

```
TYPE
  dir_tcb_rec = record
    title_ptr: ^string ( * <= max_title_len),
    service: dir_service,
    search_domain: (local_system, community, catenet),
    community_ptr: ^array [ 1 .. * ] of
          string ( max_community_len),
    user_id: ^cell,
    translation_if: ^procedure (dir_ticb: dir_ticb_rec;
      VAR abort_translation_request: boolean),
    search_type: (active_search, passive_search),
    time: 0 .. dir_max_time,
    class: (cdna_internal, cdna_external),
    wild_card: boolean,
  recend;
```

title_ptr — The pointer to the directory title to be translated. The title is a string. Max_title_len is 255 characters. If the wild_card value is FALSE, the title is matched character for character. If the wild_card value is TRUE, the title may have wild-card characters. This means the following characters have special meaning--

? — Represents any single character

* — Represents any string of characters including the null string. The '*'

may be ambiquous. For example, ABA*ABA is correctly satisfied by:

ABAABA
ABAABAABA
ABAABAABAABA
ABA_any_other_string_ABA

A maximum of 5 *'s are allowed as wild card characters in a title.

[...] Matches any single character among a group of characters in brackets. Within a bracketed group, the subrange notation A..Z where 'A' and 'Z' are any two characters means match any single character which is in the range A through Z.

[^...] Matches any single character except those in brackets. Within a bracketed group, the subrange notation ^A..Z where 'A' and 'Z' are any two characters means match any single character which is not in the range A through Z.

For example, the following wild card titles would match the following registered titles:

TRANSLATION TITLE	REGISTERED TITLES
A[123]T	A2T
	A3T
X[^B..E]J	XFJ
	XAJ

' If the registered title contains any wild-card characters as part of the complete title, those characters must be surrounded with single quotes in the translation title name. If the registered title contains a single quote as part of the title, 2 single quotes must be in the translation title name. For example, the following wild card titles would match the following registered titles:

TRANSLATION TITLE	REGISTERED TITLES
A'*'*	A*123
	A*B
	A*ZZZ
b?'?'	b1?
	bZ?
C''	C'
Q*'[]E'	QABC[]E
	QZE[]E

service — A parameter that must match the service attribute of the registered directory entry. Service is defined as a ordinal. If the ordinal is "unknown", the Service parameter is not used as part of the match criteria.

```
TYPE
  dir_service = (unknown, xerox_internet, xerox_transport,
    generic_transport, x25_support_layer,
    interactive_transfer_service);
```

community_ptr — This parameter is only used if domain is set to list_of_communities. Community_ptr is a pointer to an array of community titles. There can be up to 16 community titles. The community title is a string of 1 to 32 characters. Note, "Community " is not to be included. Trailing blanks are deleted. The communities will be searched in the order specified in the array.

search_domain — The domain where a search for the title is to be made. Default is catenet. The Directory M-E will guarantee that a title registered outside the search domain will not be returned as a translation indication.

user_id — A user supplied pointer. This pointer is returned on a translation indication and translation termination indication.

translation_if — The pointer to the procedure which will receive any translation indications and translation termination indications. This procedure has two parameters. The first parameter is the translation indication

control block which is defined in a later section. The second parameter is set TRUE by the user procedure if the translation request should be aborted or FALSE if the translation request should continue.

search_type — The type of search to be performed. Possible values are "active" and "passive". An "active" search actively requests translations from systems in the search domain. Duration of the search is determined by time. An "active" search guarantees that translation indications are unique. A "passive" search waits for translations to be distributed periodically. A "passive" search continues until terminated by the user, that is, time is ignored for a "passive" search. A "passive" search does not guarantee that translation indications are unique. The default search_type is "active".

time — The time in seconds to spend searching for the title. Time is only used for a search_type of "active". The minimum value is 0 seconds and the maximum value is 24 hours. Default is 12 seconds. Note, 0 seconds only is meaningful for a search domain of local_system.

class — The user classification value that must match the registered directory entry. Class can be CDNA internal or CDNA external. The default is CDNA internal. Note, a CDCNET external user cannot translate CDNA internal titles.

wild_card — Wild_card parameter. A boolean parameter as defined above in title_ptr. Default is FALSE.

2) DIR_TID — The translation request identifier. This field uniquely identifies the translation request. It is returned when the translation request is confirmed. Note, this translation request identifier must be supplied on an abort translation request. It has the same record format as dir_id_rec.

3.0 FEATURE DESCRIPTIONS
3.2.2 TRANSLATE DIRECTORY TITLE

3) DIR_TRANSLATE Status is returned in the procedure name. Dir_translate is set to dir_translate_ok if this request is confirmed, otherwise this TRANSLATE request is rejected--

dir_status_codes	description
dir_translate_ok	translation request confirmed
dir_title_err	title length not 1-255
dir_address_err	address record invalid
dir_domain_err	domain or relays out of range
dir_community_err	community length out of range

3.2.3 WAIT FOR TRANSLATION REQUEST

The user can wait for a Translation Request to complete with a CALL. Directory M-E will not return control to the user's RETURN until after the Translation Request has been aborted by the user via the user's translation_if procedure. This assures the user that at least one translation has occured or the search time has depleted before control is returned.

```
PROCEDURE [XREF] dir_wait (dir_tid: dir_id_rec);
```

1) DIR_TID — The translation request identifier. This parameter was returned on a translation request.

3.2.4 ABORT TRANSLATION REQUEST

The user can abort a directory translation request with a CALL. The RETURN from the call notifies the caller that the request for termination has been confirmed or rejected.

```
PROCEDURE [XREF] dir_abort (dir_tid: dir_id_rec) dir_status_codes;
```

1) DIR_TID — The translation request identifier. This parameter was returned on a translation request.

2) DIR_ABORT — Status is returned in the procedure name. Dir_abort is set to dir_abort_ok if this translation request has been terminated, otherwise this translation request has not been terminated.

dir_status_codes	description
dir_abort_ok	translation request terminated
dir_abort_err	translation request not found

3.2.5 PURGE TRANSLATION ENTRY REQUEST

The user can purge an existing Translation Data Store entry with a CALL. The RETURN from the call notifies the caller that the entry has been purged or the entry could not be found. Note, the user can use this call to purge an old directory entry out of the Translation Data Store in this system. It does not affect the Registered User Data Store. If the user fails to connect to a service, the user can issue this Purge Translation Entry Request to insure that a subsequent Translation Request will not return the same directory entry unless that directory entry is still in the original (registered) system.

```
PROCEDURE [XREF] dir_purge (title: string ( * <= max_title_len);
      dir_id: dir_id_rec) dir_status_codes;
```

1) TITLE — The title for the directory entry. This title was returned in the Translation Indication.

2) DIR_ID — The directory entry identifier. This parameter was returned on the translation indication.

3) DIR_PURGE — Status is returned in the procedure name. Dir_purge is set to dir_purge_ok if this translation data store entry was purged, otherwise this entry could not be found.

dir_status_codes	description
dir_purge_ok	Translation Data Store entry purged
dir_entry_not_found	cannot find directory entry in TDS

3.2.6 USER PROCESS PROCEDURE

The Directory M-E calls the procedure whose entry point was specified in the translation request control block when a requested title has been found, the translation request has been terminated due to search time depleted, or there are no more titles in the directory at this time. The definition for the user procedure is repeated:

```
translation_if: ^procedure (dir_ticb: dir_ticb_rec;
  VAR abort_translation_request: boolean);
```

For the response code dir_srch_time, the Directory M-E aborts the translation request. For the response codes dir_indication and dir_indication_done, the Directory M-E looks at the user returned parameter, abort_translation_request, to determine whether the translation request should be aborted. The Directory M-E does not guarantee that the title is not out of date. If the user attempts to connect to a returned directory entry and the connection fails, the user can call dir_purge to insure that the same directory entry will not be returned for a subsequent Translation Request if the directory entry is no longer in the original system. The translation indication control block follows:

3.0 FEATURE DESCRIPTIONS
3.2.6 USER PROCESS PROCEDURE

```
TYPE
  dir_response_code = (dir_indication, dir_indication_done,
    dir_srch_time);

TYPE
  dir_ticb_rec = record
    user_id: ^cell,
    case response_code: dir_response_code of
    = dir_indication =
      dir_id: dir_id_rec,
      title_ptr: ^string ( * <= max_title_len),
      address: dir_address_rec,
      userinfo_ptr: ^string ( * <= max_userinfo_len),
      service: dir_service,
      priority: <1 .. FF>,
    = dir_indication_done =
      ,
    = dir_srch_time =
      ,
    casend
  recend;
```

user_id — The pointer that was supplied by the user on the translation request. See the translation request control block.

response_code — The response code for directory translation indication is dir_indication. The response code for directory translation termination is dir_srch_time. If one or more translation indications were returned, the sequence is ended with a response code of dir_indication_done to indicate to the user that there are no more titles in the directory at this time.

dir_id — The directory entry identifier which identifies the matched title entry. The record structure is the same as defined in DIR_CREATE.

title_ptr — The pointer to the title string. Max_title_len is 255 characters.

address — The address record. The address is a variant record. The record structure is the same as defined in DIR_CREATE.

userinfo_ptr — The pointer to the user information string. If userinfo_ptr is NIL, then there is no user information.

service — A parameter that defines the highest layer end-to-end CDNA protocol to be used to communicate with this entry. Service is defined as a ordinal. If the ordienal is zero, this entry has a directly accessible service value of unknown. Unknown is the default.

```
TYPE
  dir_service = (unknown, xerox_internet, xerox_transport,
    generic_transport, x25_support_layer,
    interactive_transfer_service);
```

priority — A number which specfies the relative priority of this entry as compared with other directory entries with the same title. By convention, 1 is the highest priority. Default is 1.

4.0 PERFORMANCE

4.0 PERFORMANCE

4.1 OPERATING CHARACTERISTICS

The critical performance question is the amount of physical memory needed to hold the directory tables. The fixed size of the RDS and TDS entry is < 92 bytes. Therefore the size of the RDS and TDS entry is 92 bytes plus the variable fields. The variable fields are the title, password, user information, and communities. The fixed size of the TRDS entry is < 98 bytes. Therefore, the size of the TRDS entry is 98 bytes plus the variable fields. The variable fields are the title, password, old directory identifiers, and communities.

The memory requirement for the directory module will be less than 15k bytes. Stack space required for directory will not exceed 2k bytes.

The average execution time is as follows:

SERVICE	TIME IN MILLISECONDS
CREATE	3
CHANGE	5
DELETE	2
TRANSLATE	8
ABORT	2

These times are based on an average of 100 entries in RDS and TDS and 25 entries in TRDS.

4.2 OPERATIONAL MEASURMENTS

The following statistics are maintained by Directory M-E:

1. Number of entries in RDS
2. Amount of memory allocated for RDS entries
3. Number of entries in TDS
4. Amount of memory allocated for TDS entries
5. Number of entries in TRDS

4.0 PERFORMANCE
4.2 OPERATIONAL MEASURMENTS

6. Amount of memory allocated for TRDS entries
7. Number of requests satisfied in RDS
8. Number of requests satisfied in TDS
9. Number of requests satisfied by a Protocal Data Unit response.

5.0 FINITE STATE MACHINE

5.0 FINITE STATE MACHINE

The FSM is supplied in a separate document.

6.0 LOG MESSAGES

6.0 LOG_MESSAGES

The following software errors will be logged by Directory M-E.

LOG MESAGE ID
dme_open_3b_sap_error

DESCRIPTION
Directory M-E cannot open 3B sap during initialization

83/10/14 11:00:35 12345678JABC
Directory M-E cannot open 3b sap during initialization

LOG MESAGE ID
dme_build_trds_error

DESCRIPTION
Directory M-E. No space to build TRDS table (TRDU).

83/10/14 11:00:35 12345678JABC
No space to build TRDS table (TRDU).

LOG MESAGE ID
dme_build_tds_error

DESCRIPTION
Directory M-E--no space to build TDS table (TDU).

83/10/14 11:00:35 12345678JABC
No space to build TDS table (TRDU).

6.0 LOG MESSAGES

LOG MESAGE ID
dme_allocate_error_rcv_du

DESCRIPTION
Directory M-E cannot get space for received PDU.

83/10/14 11:00:35 12345678JABC
No space for received PDU.

LOG MESAGE ID
dme_allocate_error_send_du

DESCRIPTION
Directory M-E cannot get space for sending PDU.

83/10/14 11:00:35 12345678JABC
No space for sending PDU.

LOG MESAGE ID
dme_bad_pdu

DESCRIPTION
Directory M-E received bad Internet PDU.

MASK	LOG_MESSAGE_BUFFER_PTR^ (variable part)			
fixed text	type	value	description	
LENGTH	binary octets	2 octet	Length of Protocol Data Unit	
PDU	binary octets	1 .. 32 octets	The first 32 octets of the Bad Protocol Data Unit	

83/10/14 12:15:36 123456789ABC
Directory M-E received illegal Internet message.
Length = 525. PDU = 0007987654321ABC123456789A**()12.

7.0 INSTALLATION OPTIONS

7.0 INSTALLATION OPTIONS

none

8.0 NEW DATA TYPES

8.0 NEW_DATA_TYPES

Data types defined in above sections of this ERS are:

1)	dir_rcb_rec	Directory registration control block
2)	dir_address_rec	Directory address record
3)	dir_id	Directory entry identifier
4)	dir_domain	Directory domain types.
5)	dir_service	Directory directly accessable service designation
6)	dir_tcb_rec	Directory translation request control block
7)	dir_tid	Directory translation request identifier
8)	dir_ticb_rec	Directory translation indication control block

9.0 GLOSSARY

9.0 GLOSSARY

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