Multiple Terminal Service

DESCRIPTION

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1 GENERAL

This document describes the Multiple Terminal service, which is used when a directory number is associated to more than one phone or terminal. It covers parallel ringing as well as forking, where four different extension types or, for SIP terminals, up to four terminals in the MX-ONE can be reached on the same extension number. The feature was earlier called Parallel Ringing, but since the feature was expanded to enable multiple terminals to be registered to the same SIP directory number, the name was changed to Multiple Terminal service to reflect this new functionality.

1.1 DEFINITIONS

In order to clarify the difference between the parallel ringing feature and the forking feature, the following definitions have been added.

1.1.1 PARALLEL RINGING

For a parallel ringing configuration, there can be 1 main extension and up to 2 secondary extensions. The particularity here is that the extensions in a parallel ringing scenario each member in the seizure list has a ***different*** directory number. Only one remote/mobile extension is allowed in a parallel ringing configuration. Different alert profiles are possible. In the case of parallel ringing, each device requires an extension license.

1.1.2 FORKING

For a forking configuration, then main difference with Parallel ringing is that there can be up to 4 terminals registered on ***one*** directory number.

Only one Remote/mobile extension, Cordless DECT extension or H.323 IP extension is allowed in a forking multiple terminal configuration. Up to 4 SIP terminals are allowed to be registered to the same directory number.

If the extension types are different, then an extension license is needed for each generic extension type (IP/SIP, DECT or Mobile extension).If all the terminals are SIP devices, then one IP/SIP extension license is required for the first device and up to 3 Extra Device licenses will be needed for the additional terminals. If video media shall be supported/used by one or several terminals connected to a directory number, then one video media license will be needed for that directory number.

If the terminal(s) is a Mitel BluStar or MiCollab soft-client, then a specific Mitel BluStar or MiCollab client capability license is required. It is not possible to combine the Intercom feature with the multi-terminal/forking feature.

1.1.3 MEDIA CONSIDERATIONS FOR IP END-POINTS

Note: For H.323 end-points the connections in parallel ringing and forking will be forced gateway, even if both calling party and alerted B-party support H.323. For SIP end-points the connections in parallel ringing and forking will be direct media.

1.2 GLOSSARY

For a complete list of abbreviations and glossary, see the description for ACRONYMS, ABBREVIATIONS AND GLOSSARY.

2 FACILITIES

2.1 FUNCTIONAL OVERVIEW

The Multiple Terminal (Parallel Ringing or Forking) service provides the user with simultaneous or serial ring signal on up to three (or four for forking) predefined answering positions for an incoming call to the user.

When the user answers the call, the call is directed to the extension where it has been answered.The Multiple Terminal service provides the user with the possibility to have more than one terminal at their disposal, where these terminals are associated to the same directory number. In the case of the parallel ringing scenario, where the terminals are of different extension numbers, up to 2 secondary extension numbers can be associated to a primary number and when an incoming call arrives to the user's primary number, the system will provide simultaneous or serial ring signal to these predefined answering positions.

Up to 4 terminals can be have the same directory number and the forking feature allows all terminals to ring simultaneously when an incoming call arrives for the user. In either case, when the user answers the call, the call is directed to the terminal where it has been answered.

With simultaneous ringing, although configured to ring at the same time, there could be slight delays between the ringing on different terminals, depending on the terminal type, location and system load. When parallel ringing is used, the function is handled through a seizure list, set by the parallel_ringing command, which defines the directory numbers involved. With generic extensions, forking is used and the number of allowed terminals is set using the –max-terminals parameter in the extension command.

The seizure list can be initiated with parallel ringing as one main extension and one or two secondary extensions or it can be done using the Forking implementation with generic extensions with up to four SIP terminals or a combination of generic extension types, up to the limit of 4.

Forking allows for four terminals in the MX-ONE system or three terminals in the MX-ONE system and one in another system (e.g. remote extension). If the terminals registered to the MX-ONE are Mitel SIP terminals or soft clients, then they can be of the same or different types.

In the case of multi-media end-points, such as Mitel BluStar for PC, Mitel Blustar for iPad/iPhone or the Mitel BluStar 8000i, the allowed types and multi-media capabilities are controlled using parameters in the extension command. For a detailed description of the extension command parameters, please refer to the extension command description, see TECHNICAL REFERENCE GUIDE, UNIX COMMAND DESCRIPTION.

When the multiple terminal function is handled as a serial ringing list, the delay between the individual ring signals needs to be set. See 2.5.1 Parallel Execution on page 7 or 2.5.2 Serial Execution on page 7.

The Multiple Terminal service has the following characteristics:

Parallel ringing with different extension types:

- The extensions that are set to ring simultaneously or serially are grouped as a seizure list. A seizure list can for parallel ringing consist of one main extension and one or two secondary extensions, and for forking a total of up to 4 extensions.

- Call to a seizure list is made through the main extension number only.

- The multiple terminal service is not performed for a direct call to a secondary extension of a seizure list.

- It is not possible to define an extension in more than one seizure list.

- If the incoming call to a seizure list is from another extension on the same list, then the call is distributed to the remaining extensions in the list. But, if the call is from an extension that is not part of the list and if the list is busy then the incoming call to that seizure list is reported as busy.

- If there is a call to an extension or member of the seizure list, it is possible to transfer the call to other members of the list.

Forking with generic extensions:

- There can be up to four generic extensions with the same directory number.

- Up to 4 SIP extensions can register to the same directory number.

- Besides SIP terminals, one H.323, DECT or mobile extension can be connected to the same directory number up to the limit of four total terminals.

- Forked extensions do not use the parallel ringing feature.

- All registered extensions are set ring simultaneously (forking feature), regardless of their location.

- By default, when one terminal is busy, the other terminals are marked as busy unless the extension profile is set to allow other terminals to receive calls, even if one terminal is busy. See section 2.8 for details.

- SIP terminals can be a combination of voice and multimedia terminals or clients.

- If there is a call to one forked terminal, it is possible to transfer the call to any of the other terminals (fast forward).

2.2　　ANSWERING POSITIONS

Only internal extensions (Extensions in the same node) are allowed to be defined as answering positions of a seizure list.

The following extension types are supported:

- Analog extension

- Digital extension (ODN and ADN)

- CAS extension

- Cordless DECT extension

- SIP extension and EDN (EDN only possible as main directory and when forking)

- H.323 extension

- Remote extension

Any combination of the above extension types may be used to define a list. However, it is possible to define only one remote extension per list at any position.

The following types are not permitted:

- An ACD agent

- Emergency extension

- A group number

2.2.1 REMOVING EXTENSIONS FROM A SEIZURE LIST

Digital and analog extensions, which are part of a seizure list, cannot be removed without first removing them from the seizure list. If an attempt is made a NOT ACCEPTED error message will be given.

Note: Generic extensions can be removed although they are part of a seizure list. **No error message will be given**.

2.3 PRIORITY OF MULTIPLE TERMINAL SERVICE

An order of priority is defined to execute the proper service when several services are activated on the user number, i.e. the main extension of a seizure list. The order of priority in which activated services are performed is as follows:

1) Message Diversion/External Follow me/Direct Diversion/Follow-me

2) Individual Repeated Distribution (Personal Number)

3) Individual Do Not Disturb

4) Group Do Not Disturb

5) Multiple terminal service

6) Diversion on Busy/Diversion on No Reply

Note: Follow-me to main or own extension number service has special significance with respect to activation and deactivation of the multiple terminal service. See 2.9.1 Activate or Deactivate Multiple Terminal Service on page 10.

Note: If even more services are involved, for example bypass, or if calling a secondary extension in a Parallel Ringing configuration, the priority order may differ.

2.4 CALL DISTRIBUTION

Incoming calls to the main extension of a seizure list are distributed to extensions defined in the list according to the distribution schedule defined for the seizure list.Incoming calls to the main extension of a seizure list are distributed to extensions defined in the list according to the distribution schedule defined for the seizure list. The following conditions are exceptions for call distribution:

1. If an incoming call to the seizure list is from an extension which is not part of the list and when any of the extensions is busy the call is not distributed, unless the busy extension has free on second line active.

2. If any of the high priority services (see 2.3 Priority of Multiple Terminal service on page 5) are active on the main extension, then that particular service is performed.

3. If an extension in the seizure list hosts a free seating extension, then the seizure list calls are not distributed to that extension.

4. If an extension in the seizure list is a free seating extension and is logged on then it receives calls through the seizure list call distribution. If not logged on, only that extension does not ring.

5.   If an extension in the seizure list has follow-me to the main extension activated, then the seizure calls are not distributed to that extension.

6.   If an extension in the seizure list is not logged on (valid for generic or free seating extension) or blocked or detached (valid for cordless), then the seizure list calls are not distributed to that extension. If all the extensions in the seizure list are unavailable, then the status of the main extension is provided to the calling party.

7.   If a secondary extension in the seizure list has follow me to itself activated, then the seizure list calls are only distributed to that extension.

2.5   PARALLEL OR SERIAL EXECUTION

The multiple terminal service can be set for either simultaneous, that is, parallel execution, or that the ringing should be done serially.

Note: In case a Remote extension is included in the multiple terminal service seizure list, it may be wise to use the delay seizure list option (in case the cooperating PLMN/PSTN is slow), and delay the ringing for 2-3 seconds for the remote extension. This is to make it possible for an attendant or extension to extend/transfer the call before the seizure towards the remote extension is started.

2.5.1   PARALLEL EXECUTION

In parallel execution the main extension will be alerted before any secondary extension. The delay time parameter should be zero.

2.5.2   SERIAL EXECUTION

If the delay time parameter has been set to greater than zero the ringing will done serially.

2.6   FORKING

2.6.1   GENERAL

Forking means registration of more than one terminal or client on the same generic extension directory number. Forking for a specific extension number is controlled by a parameter in the extension command.

The forked extension can be ringing in parallel, similar to the parallel ringing feature, or in parallel with delay, or ringing serially, depending on configuration, but still differs from parallel ringing in some aspects due to the fact that there is only one directory number. There are a few different registration options, like normal manual login, and automatic login (which cannot be pushed out).

2.6.2   PUSH-OUT (FORCED LOGOUT) PRINCIPLES

The multiple terminal service cannot allow an unlimited number of terminals to register on the same number, so there is a principle on whether to reject a registration, or accept it after de-registering some previously registered terminal.

The H.323 terminal, the DECT terminal and the Remote extension only allow one registered terminal per directory number, while SIP terminal allows several forked. Primarily push out terminals of the same type as the one trying to register.

For SIP terminals there is a priority depending on type of SIP end-point: first hand choice is to push out same phone type among ordinary voice SIP phone, soft SIP client and video SIP phone. Second choice is to push out first found other SIP phone type. Third choice is to push out another type of generic extension (allowed to push out).

Terminals with automatic registration will never be pushed out. Examples of such terminals would be the MMC+ client or a remote extension. The following SIP terminals/clients can be pushed out: Mitel 6900/6800/6700 families, Mitel BluStar 8000i, Mitel BluStar client, and Mitel DBC4xx/7400 SIP family.
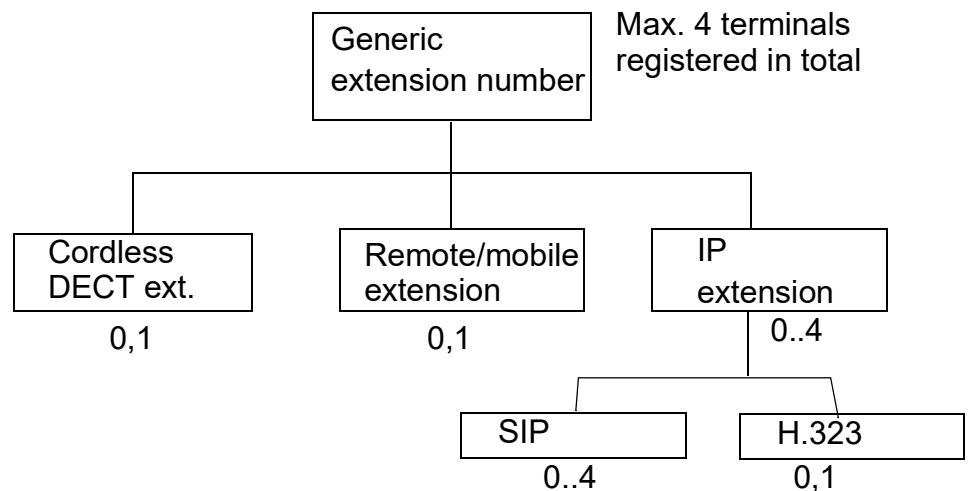

Figure 1: Multiple terminals registered to one (generic extension) number. Limitation differences per type.

2.6.3 TAKE OWN CALL ON ANOTHER MULTIPLE TERMINAL

A call in two-party speech can be picked/moved onto another terminal belonging to the same user, by dialing a service code. If more than one of the user's terminals have calls in speech, no call will be picked.

If no call is picked, an analysis is done to find if any other call can be picked (i.e. common bell, group call, universal night service).

2.6.4 INTER-WORKING WITH OTHER SYSTEMS

The MX-ONE system can have interoperability with other systems using a Forking method, based on SIP extension signaling between the two systems. A user can have terminals registered as forked in both the other system and in MX-ONE (remote extension), but from a user perspective, the terminals appear to belong to the same system.

The forking implies that all extensions belonging to a user can be reached if they are registered in either the other system or MX-ONE, regardless if the call originates from a trunk, from the other system or MX-ONE.

The solution is that each user will have one number represented as a forking list in the other system, and a forking or seizure list in MX-ONE.

2.7 CALL REJECTION

If a DECT, remote, or IP extension rejects a seizure list call, then the seizure list calls that have already been distributed are released and the calling party receives a busy message. The subsequent busy services, for example, call back, are invoked at the main extension irrespective of the fact that a seizure list call can be rejected from any of the extensions.

2.8 HANDLING OF BUSY SCENARIOS

When a call is made to the main extension of a seizure list, first a check is done to ensure if calling party is part of the list. If the extension is part of the list then the status of extensions in the list is checked.

If at least one of the extensions is free, then the call is distributed to the list. If the calling party is not part of the list, then the status of the extensions part of the list is checked. If none of the extensions is busy, then the call is distributed to the list.

If the main number is a generic extension (with or without forking), a category exists that controls if the user shall be regarded as busy or if all multiple extensions shall be called, even if one has been reported busy earlier. This is controlled by the --ext-serv parameter of the extension command, where D22 shall be set to 0 (default) or 1. The default behavior is to mark the extension as busy when one terminal is busy.

2.8.1 LIST FOUND BUSY BEFORE CALL DISTRIBUTION

If the status of one of the extensions in the seizure list is found to be busy, and if the incoming call to the list is from an extension, which is not part of the list, then the incoming call to the list is directed to the busy extension. If more than one extension in the list are busy, then the incoming call is directed to the first extension found busy in the list.

2.9 USER INTERFACE

The call distribution services programming from each seizure list extension applies only to that particular extension.

2.9.1 ACTIVATE OR DEACTIVATE MULTIPLE TERMINAL SERVICE

Activation or deactivation of the multiple terminal service makes it possible to allow or avoid an extension to ring when it is defined in a seizure list. There is no special procedure defined to activate or deactivate the multiple terminal service, but logout/login, call list or follow-me can be used.

If follow-me to the main extension number is activated from any of the seizure list extensions (main or secondary), an incoming call to the seizure list is not distributed to that particular extension.

2.9.2 PROGRAMMING OF SERVICES TO A MULTIPLE TERMINAL SERVICE USER

The programming of services to the seizure list makes it possible to allow secondary extensions to initiate services to the main directory number. The following services can

be activated or deactivated on the main directory number from the secondary directory number.

- Message Diversion
- Call Diversion
- Follow-me
- External Follow-me
- Do Not Disturb
- Individual Repeated Distribution or Personal Number
- General cancellation

The procedure for activating or deactivating services on the main directory number from the secondary directory number is the same as the procedure for invoking it onto oneself.

Note: A secondary extension cannot have any service to itself.

2.10 SOME INTERACTIONS WITH OTHER FEATURES

2.10.1 CALL DIVERSION

If the main extension of a seizure list has a diversion service active, then the priority order described in earlier, see 2.3 Priority of Multiple Terminal service on page 5, is to be considered. Follow-me to main extension has a special significance with regard to the multiple terminal service. If follow-me to the main extension number is activated on any of the seizure list extensions (main/secondary), incoming call to the seizure list is not distributed to that particular extension. It is not possible to define a divert position for a secondary extension.

Diversion on Busy An incoming call to a busy seizure list (irrespective of which extension in the list is busy) is diverted only if diversion on busy is active for the main extension. Otherwise, the call is directed to the extension, which is first found busy in the list. Activation and deactivation of Diversion on Busy from a secondary extension will be executed towards the main extension.

Diversion on No Answer Diversion on No Answer is executed, if the service has been requested on the main extension (provided the main extension is ringing) when an incoming call to a seizure list is unanswered. As a result, the seizure list calls to secondary extensions are released (if any seized). Activation and deactivation of Diversion on No Answer from a secondary extension will be executed towards the main extension.

2.10.2 CALL INFORMATION LOGGING

For an incoming call to a seizure list, although several CIL records are created (one for the caller and one for each terminal in the list), the CIL record created for the call from the calling party to the seizure list is the only one that may be output.

2.10.3 CSTA FUNCTIONS

For extensions with Multiple Terminal Service Forking, CSTA Monitoring (and event reporting) and CSTA call control services are supported, if the served device supports terminal identity/sub-address.

For extensions with Multiple Terminal Service Parallel ringing, CSTA Monitoring (and event reporting) and CSTA call control services are supported, if the involved devices (with different numbers) are CSTA monitored.

2.10.4 DO NOT DISTURB (GROUP/INDIVIDUAL)

If the main extension of a seizure list has any DND service active, then the call is not distributed to the list and the same reason is reported to the calling party. Activation and deactivation of Do not Disturb from a secondary extension will be executed towards the main extension.

2.10.5 FREE SEATING

If the main or any of the secondary extensions of a seizure list is a free seating extension, then the multiple terminal service is not affected. The extensions receive incoming calls through normal distribution when logged on. If the main or any of the secondary extensions of a seizure list hosts a free seating extension (a free seating extension logs on to the main or secondary extension), then that extension becomes unavailable for seizure list call distribution in a similar way as if the extension is not logged on into any terminal or is blocked.

2.10.6 GROUP HUNTING, CASCADE RING GROUP

2.10.6.1 Group hunting

The main extension of a seizure list for **Parallel Ringing** can be defined to be a member of a group-hunting group. When there is a call to a group hunting group, the main extension of a seizure list may be selected for call distribution using the group hunting principles.

The status of the secondary extensions is not checked while selecting a main extension. If a main extension is selected, the call is distributed to the main extension only.

The secondary numbers are treated like any normal directory number and they do not affect the main number or the other secondary numbers. Thus, it is not recommended to have an extension with Parallel ringing as hunt group member.

An extension with Multiple Terminal Service Forking can be member of a hunt group. In case of a group call, all logged-on forked terminals are alerted.

An extension with Multiple Terminal Service with both Forking and Parallel Ringing, can be defined as a member of a group hunting group.

For a call to a group hunting group, the main extension (forked terminals) of a seizure list may be selected for call distribution using the group hunting principles. The statuses of the secondary extensions are not checked while selecting a main extension. If a main extension is selected, the call is distributed to the main extension only (that is, all forked terminals).

The secondary numbers are treated like any normal directory number and they do not affect the main number, nor the other secondary numbers. Thus, it is not recommended to have an extension with both Forking and Parallel ringing defined as hunt group member.

A hunt group number cannot be defined to be a member in a multiple terminal service seizure list.

2.10.6.2   *Cascade ring group*

A seizure list for **Parallel Ringing** main or secondary extensions can be defined as members of a cascade ring group. Only the directory numbers defined as group members will ring for calls to the group.

An extension with Multiple Terminal Service **Forking** can be member in a cascade ring group. A group call will ring on all forked terminals. When the last terminal logs off, the user will become unavailable to the group.

A cascade ring group number cannot be defined as a part in a multiple terminal service seizure list.

2.10.7   MULTIPLE REPRESENTATION AND NAME SELECTION (MDN/MNS)

The Multiple Terminal Service seizure list (used for example for parallel ringing) can be multiple represented in MDN / MNS keys, having a common status behaviour and allowing the call pick-up for incoming calls to any of the seizure list extensions.

The MDN keys for a seizure list can only be defined if the main extension is ATS, DTS or CAS extension. MNS keys are available for all kind of seizure list main extensions.

If the main extension is not available (blocked, detached etc.) and there are secondary extensions which are still available, the incoming calls to the multiple terminal service seizure list are reported to the MDN / MNS keys.

If call is picked using MDN key of main extension on call to secondary extension, then the list should be busy.

Note: There is a limitation for the MNS feature when the Parallel Ringing feature is used by the monitored extension:

If the MNS monitoring extension is a SIP- or H.323-telephone, and the monitored user (a main extension which also has secondary extensions), MNS keys need to be defined/initiated for both main and secondary extensions. For this reason, it is preferred to use Forking instead of parallel ringing.

2.10.8   NAME AND NUMBER LOG/CALL LOG

The terminals/end-points usually have a local call log function, which will log alerted calls, in all parallel ringing or forked terminals. For originated calls only the terminal which is used to make the call will log it.

For answered calls alerted at multiple terminals, when the terminals are SIP extensions/clients that support RFC 3326 ("call completed elsewhere"), logging can be avoided in the following cases:

- In forked or parallel ringing calls when the user answered on another terminal.

- When an operator makes a call and makes a transfer (extending) of the the original caller to the called party before the called party answers. In order to not log a 'missed call' on the operator call.

For answered calls with other extension types than SIP and DTS, the calls will be logged as missed calls for the non-answering multiple terminals.

2.10.9   SHORT MESSAGE SERVICE

The incoming SMS message to the main extension of a seizure list is delivered to the first available supporting extension in the list.

3   HARDWARE

No specific hardware is required for this facility.

4   SUMMARY

The Multiple Terminal service is used when it should be possible to alert and use more than one phone (terminal) when calling an extension.

There are two methods to invoke this feature; either create a **parallel ringing** list with 1 main extension number and up to 2 secondary extension numbers, or enable **forking** for a generic extension, with up to 4 terminals registered to the same directory number.