**OVERVIEW**

Overview     The Flexible Numbering feature allows the assignment of dial strings of 1~ 5 digits to any kind of directory number and any access code internally.

The flexible numbering plan is shared across tenants.

The numbering plan has the following aspects:

- Directory numbers and access codes share the same numbering plan
- Any telephone which has a dialing capability shares the same numbering plan. Note that not all the digit strings may be entered because of the physical attribute of dialing device, such as the telephone which does not have [#] key.
- The digits in the numbering plan are the following;
  0, 1, 2, 3, 4, 5, 6, 7, 8, 9, *, #
- The digit string has to be identified without any ambiguity.

For example, the following assignment is allowed.

| 122 | Access code for AAA feature |
|-----|-----------------------------|
| 1230 | Prime Directory Number for Station B |
| 1231 | Phantom Directory Number |
| 1232 | Access code for CCC feature |

The following assignment is prohibited because the digit string 1220 contains another digit string starting with 122 and the system cannot determine the meaning of string when 122 is received.

| 122 | Access code for AAA feature |
|------|-----------------------------|
| 1220 | Prime Directory Number for Station B |

As long as the condition above is satisfied, a directory number and an access code may be mixed next to other.

The digit string pattern should look like:

- Directory Number
- Access Code
- Access Code + Parameter1
- Access Code + Parameter1 + Parameter2
- Access Code + Parameter1 + Parameter2 + Parameter3

Where Paramter1 through Parameter3 is a directory number, an index, time, date, a timer value, an external number and so on.

The IP*edge* has to take not only the internal numbers but also external numbers or other parameters.

The following sections describe the behavior of IP*edge* in terms of digit handling:

The system analyzes the digit string from the beginning, interprets and extracts the meaning or parameters. With the IP*edge* numbering plan, the system detects the end-of-digits automatically. For the external numbering plan, the system tries to determine the end-of-digits using the database. There are some external digit-strings which length the system cannot determine. The typical example of this is international telephone numbers. An action upon the detecting the end-of-external-digit-string depends on the feature where it is entered.

Use of the # key    In the IP*edge* system, # key is used in the following ways:

- The # is used inside the IP*edge* numbering plan

- When # is used, it is treated as a digit.

- The # is also used for the External numbering plan – When # is used within the external numbering plan, it is treated as an indication of end-of-digit to the IP*edge* system except the case where # appears as the very first digit of public telephone number or following Network ID in case of Network Feature Access Code. In both cases, # is copied and sent to the line. The # as an end-of-digit tells the system that there are no additional external digits, thus the system goes into communication mode. Thereafter, the digits are treated as an end-to-end signalling. If a user wants to bury the # in the external numbering plan during programming mode, e.g. as an access code to the destination PBX, the escape sequence shall be used to enter # as a digit.

- The # used inside the other digit string – When # is used within the other digit string, it is treated as an indication of end-of-digit to the IP*edge* system and it is not regarded as a digit.

- The # used inside the escape sequence – Explained later in this section.

- The # used during talking (active) state – # is sent to the far end party transparently and the system does not interpret it.

**Examples**:

The following examples give a better understanding on the usage of #.

**Example 1**: Call origination

[123]

As soon as the last digit of DN or access code is input, the system acts based on the input digits.

[123] + [#]

If the # is input mistakenly after DN or access code, it is treated as over digit. Although the treatment of over digit depends on each feature, it is ignored and causes no problem.

[9] + [1234567] + [#]

If the # is entered while a user is making an outside call, it shall be treated as the end-of-digit. The system copies # to the line so that # is sent out. The system may detect the end-of-digit by analyzing the digit string before # is entered. In this case, the system acts upon the detection and the additional # is treated as a digit for End-to-End signalling.

**Example 2**: If CFNA expects the destination and timer value as an option.

[CFNA] + [DN] + [#]

As soon as the last digit of DN is entered, the system detects the end of digit and gives the Entry Tone for the next input.  # indicates the NULL input for the timer value.

[CFNA] + [9] + [123456] + [#] + [12] + [#]

The first # is treated as an indication of end-of-external-string and is not stored as a destination. The second # is treated as an indication of end-of-timer-value. The system knows the timer value is "12".

[CFNA] + [9] + [123] + [ESC] + [#] + [456] + [#]

The first # following [ESC] is treated as a digit and is not interpreted as an end-of-digit, while the second #]is treated so. In the memory, "123#456" is stored.

[CFNA] + [9] + [1234567] + [890] + [#]

The system may detect the end-of-external-digits by itself when [7] is input. Since it is in the programming mode, the system shall continue to receive digits within the context of the external numbering plan until [#] is entered. This allows a user to program additional digits to access the remote system following the destination number. In this case, "1234567890" shall be stored.

Usage of the * key

In the IP*edge* system, * can used in the following ways:

- When * is used inside the IP*edge* numbering plan – Regardless of the position where * is used, it is treated as a digit.
- When * is used inside the External numbering plan – When * is used within the external numbering plan, the treatment depends on the context where it is used. If * is entered while making a call, it is treated as a digit, that is usually the delimiter for the sub address in the ISDN context. If it is used during the programming mode, it is treated as an indication of the escape sequence. If the external numbering plan requires * as a digit during programming mode, e.g. as an access code to the destination PBX, the escape sequence shall be used to enter * as a digit.
- When * is used inside the other digit string – When * is used within the other digit string, it is treated as a digit.
- When * is used inside the escape sequence – Please refer to the later Escape Sequence below.

Escape Sequence

The escape sequence enables a user to enter special information which cannot be expressed only by digits. The examples of this are the pause code, the dial pulse to tone change, # as a digit and * as a digit. The escape sequence is significant only in the programming mode, either user programming mode or system programming mode.

[*] + [0]Pause code 0 (10 seconds)

[*] + [1]Pause code 1 (1 second)

[*] + [2]Pause code 2 (2 seconds)

[*] + [3]Pause code 3 (3 seconds)

[*] + [4]Pause code 4 (4 seconds)

[*] + [5]Pause code 5 (5 seconds)

[*] + [6]Pause code 6 (6 seconds)

[*] + [7]Pause code 7 (7 seconds)

[*] + [8]Pause code 8 (8 seconds)

[*] + [9]Pause code 9 (9 seconds)

[*] + [#][#] as a digit, not as an end-of-digit

[*] + [*][*] as a digit, not as an end-of-digit

Special Treatment

As per the requirement, two access codes can be assigned to Least Cost Routing feature. This shall be treated as a special case.

**Flexible Numbering**
The system-numbering plan can be customized for the user's needs. Directory numbers, line and feature access codes, and Network Coordinated Numbering can be established uniquely in each system.

Coordinated Numbering Plan
IP*edge* Net can be configured to allow users to call each other across network nodes with simple network directory numbers. This eliminates the user's need for access codes and network maps. Calls that encounter a busy or unanswered destination can be forwarded to any node in the network, including a centralized voice mail system or attendant.

**Flexible Numbering**

| | |
|---|---|
| IP*edge* Numbering Plan | The numbering plan that IP*edge* interprets and determines what a user wants to do. |
| External Numbering Plan | Either public numbering plan or private numbering plan. Any digit string following the external number is considered as a part of the external number, even though it is only significant to the destination. |
| Public Numbering Plan | The numbering plan applied in the public network. Any digit string following the external number is considered as a part of the public number, even though it is only significant to the destination. |
| Private Numbering Plan | The numbering plan applied in the private network. Any digit string following the external number is considered as a part of the private number, even though it is only significant to the destination. |
| Other Digit String | The digit string that does not belong to any numbering plan. The examples for this are: date, time, a timer value, and iteration number. |

The system analyzes the digit string from the beginning, interprets and extracts the meaning or parameters. As for the IP*edge* numbering plan, the system detects the end-of-digit using the database. There are some external digit-strings whose length the system cannot determine. A typical example is the international telephone number. An action upon detecting the end-of-external-digit-string depends on the feature where it is entered.

Use of [#] Key   In the public network, # key is often regarded as the end-of-digit. Since this custom needs to be considered in IP*edge*, the treatment of # key is special.

- # used inside the IP*edge* numbering plan, it is treated as a digit.
- # used inside the External numbering plan, used within the external numbering plan, it is treated as an indication of end-of-digit except the case where # appears at the very first digit of public telephone number or following Network ID in case of Network Feature Access Code.
- # as an end-of-digit implies the system that there are no more external digits, thus the system goes into communication mode. Thereafter, the digits are treated as an end-to-end signalling.

  If a user wants to bury # in the external numbering plan during programming mode, e.g. as an access code to the destination system, the escape sequence is used to enter # as a digit.

Use of [*] Buton   In the IP*edge* system, * also has special meaning.

1. *used inside the IP*edge* numbering plan, it is treated as a digit.
2. * used inside the External numbering plan

When * is used within the external numbering plan, the treatment depends on the context where it is used. Refer to the Overview section of this description.

3.  * used inside the other digit string, it is treated as a digit.

4.  * used inside the escape sequence

Refer to the Overview section of this description.

**PROGRAMMING**

| | |
|---|---|
| Flexible Numbering | The system numbering plan can be customized for the user's needs. Directory numbers, line and feature access codes, and Network Coordinated Numbering can be established uniquely in each system. |

Delete a Flexible Access Code

1. Click on **System > Flexible Access Codes**.
2. Click the access code to be changed.
3. Click on **Delete**.
4. Confirm the deletion of the code.

Add a New Flexible Access Code

1. Click on **New**.
2. Enter the code.
3. Select the feature from the drop down.
4. Click on **Save** icon.

Change a Flexible Access Code

1. Click on **System > Flexible Access Codes**.
2. Delete the code to be changed.
3. Enter the new code.
4. Click on **Save** icon.

| Name | Description |
|---|---|
| Flexible Numbering Plan | Digits of feature access code. (per the system, Max 5 digits, Default = Not Set) |
| Flexible Numbering Feature | Type of feature access code (per the system, Values are shown in the table below) |
| Flexible Numbering OLG | Outgoing Line Group Number (per type of feature access code, 1-220, Default = Not Set) |

Following table shows the relationship between feature and feature code specified by Flexible Numbering Feature.

| Flexible Number Feature Value | Feature | Default Value |
|---|---|---|
| 150 | Automatic Busy Redial (ABR) registration | #441 |
| 151 | ABR cancle | #442 |
| 170 | Local Call Park | #33 |
| 173 | Retrieve Parked Call | #32 |
| 174 | System Orbit | 7000 ~ 7019 |
| 180 | Do Not Disturb (DND) registration | #6091 |
| (Sheet 1 of 4) | | |

| Flexible Number Feature Value | Feature  (continued) | Default Value |
|---|---|---|
| 182 | DND cancel | #6092 |
| 183 | Remote DND cancelation feature access code | #6192 |
| 220 | All paging feature access code | #30 |
| 230 | Group paging feature access code | #31 |
| 240 | All Emergency paging feature access code | #37 |
| 250 | Group Emergency paging feature access code | #38 |
| 260 | Station Speed Dial access code | *1 |
| 261 | System Speed Dial access code (From Index 000 to 099) | *2 |
| 262 | System Speed Dial access code (From Index 100 to 199) | *3 |
| 263 | System Speed Dial access code (From Index 200 to 299) | *4 |
| 264 | System Speed Dial access code (From Index 300 to 399) | *5 |
| 265 | System Speed Dial access code (From Index 400 to 499) | *6 |
| 266 | System Speed Dial access code (From Index 500 to 599) | *7 |
| 267 | System Speed Dial access code (From Index 600 to 699) | *8 |
| 268 | System Speed Dial access code (From Index 700 to 799) | *9 |
| 340 | Call Forward All (Any Call) registration access code | #6011 |
| 341 | Call Forward Busy (Any Call) registration access code | #6021 |
| 342 | Call Forward No Answer (Any Call) registration access code | #6031 |
| 343 | Call Forward Busy/ No Answer (Any Call) registration access code | #6041 |
| 350 | Call Forward All (External Call) registration access code | #6013 |
| 351 | Call Forward Busy (External Call) registration access code | #6023 |
| 352 | Call Forward No Answer (External Call) registration access code | #6033 |
| 353 | Call Forward Busy/ No Answer (External Call) registration access code | #6043 |
| 360 | Call Forward All (Any Call) remote registration access code | #6012 |
| 361 | Call Forward Busy (Any Call) remote registration access code | #6022 |
| 362 | Call Forward No Answer (Any Call) remote registration access code | #6032 |
| 363 | Call Forward Busy/ No Answer (Any Call) remote registration access code | #6042 |
| 370 | Call Forward All (External Call) remote registration access code | #6014 |
| 371 | Call Forward Busy (External Call) remote registration access code | #6024 |
| 372 | Call Forward No Answer (External Call) remote registration access code | #6034 |
| (Sheet 2 of 4) | | |

| Flexible Number Feature Value | Feature    (continued) | Default Value |
|---|---|---|
| 373 | Call Forward Busy/ No Answer (External Call) remote registration access code | #6044 |
| 380 | Call Forward (Any Call) cancelation access code | #6051 |
| 390 | Call Forward (External Call) cancelation access code | #6053 |
| 400 | Call Forward (Any Call) remote cancelation access code | #6052 |
| 410 | Call Forward (External Call) remote cancelation access code | #6054 |
| 530 | Entering account code feature access code | #46 |
| 531 | Setting account code feature access code | Not set |
| 532 | Deleting account code feature access code | Not set |
| 545 | Phone user mobility log out feature access code | Not set |
| 551 | Outgoing call by designating a trunk group access code | Not set |
| 580 | LCR feature access code | 9 |
| 591 | VM-MW registration access code | #63 |
| 592 | Received MW canceling access code | #409 |
| 593 | Sent MW canceling access code | #64 |
| 594 | MW answering access code | #408 |
| 600 | Automatic Callback cancelation access code | #431 |
| 610 | BGM starting feature access code | #490 |
| 611 | BGM stopping feature access code | #491 |
| 650 | Class Of Service Override access code | #471 |
| 670 | System Call Forward activation access code | #620 |
| 671 | System Call Forward inactivation access code | #621 |
| 678 | Call pick up – Combination of answering the terminating call, retrieving the held call, and retrieving parked call with specified DN. | #5#29 |
| 679 | Call pick up – Combination of answering terminating call and retrieving held call with specified DN. | #5#6 |
| 680 | Call pick up – Group pick up for terminating call. | #5#34 |
| 681 | Call pick up – Directed terminal pick up for terminating call. | #5#5 |
| 682 | Call pick up – Directed group pick up for terminating call. | #5#32 |
| 683 | Call pick up – Directed DN pick up for terminating call. | #5#22 |
| 684 | Call pick up – Any external call of terminating. | #5#9 |
| 686 | Call pick up – Local retrieving for held call. | #5#71 |
| 687 | Call pick up – Remote retrieving for held call. | #5#72 |
| 688 | Call pick up – Directed DN retrieving for held call. | #5#74 |
| (Sheet 3 of 4) | | |

| Flexible Number Feature Value | Feature    (continued) | Default Value |
|---|---|---|
| 689 | Call pick up – Combination of directed terminal pick up for terminating call and retrieving held call. | Not set |
| 690 | Transferring to Voice Mail access code | #407 |
| 700 | Repeat Last Number Dialed access code | *0 |
| 710 | Beep tone volume adjustment access code | #6101 |
| 720 | LCD display language change access code | #495 |
| 730 | Advisory Message registration access code | #411 |
| 731 | Advisory Message cancelation access code | #412 |
| 740 | Emergency call access code | #911 |
| 750 | Attendant console group access code | 0 |
| 751 | Operator call access code | Not set |
| 760 | Private networking access code | 8 |
| 770 | Node ID | Not set |
| 780 | * substitution access code | 441 |
| 781 | # substitution access code | 440 |
| 783 | Specified caller number access code | #888 |
| 850 | Set Lock Password access code | Not set |
| 851 | Cancel Lock Password access code | Not set |
| 870 | Call Monitor log out feature access code | #963 |
| 890 | UCD local login feature access code | #6061 |
| 891 | UCD local logout feature access code | #6062 |
| 892 | UCD remote login feature access code | #6161 |
| 893 | UCD remote logout feature access code | #6162 |
| 920 | Local date adjustment access code | #653 |
| 921 | Local time adjustment access code | #654 |
| (Sheet 4 of 4) | | |

**CAPACITY**                   Not Applicable

**AVAILABILITY**               All Systems

**RESTRICTION**                # and * substitute access code may not execute features. For example, it is possible to invoke direct transfer feature by using # substitute access code when feature access code includes #. However, it is not possible to use # substitute access code when DN includes # or entering end of digit.

**HARDWARE**          No additional hardware is necessary for this feature.

**FEATURE INTERACTION**

Multi-System Networking.

Advanced networking features include Centralized Voice Mail, Centralized Attendant, Network SMDR and Station DSS key appearances across all nodes. Alternate routing provides for toll bypass configurations and automatic recovery from network disruptions.

The systems are interconnected with DSI (T1) circuits to provide ISDN trunk-type interconnectivity. IP*edge* Net also provides full connectivity and capabilities over an IP network (VPN WAN, Internet, Intranet Frame Relay, fiber, or wireless).

Up to 128 nodes can be accommodated within the IP*edge* Net numbering plan. Up to four nodes connected in tandem can give satisfactory performance with regard to latency. As with any network design, transport delay, speech volume, and other issues must be carefully considered.

You can set up Network DN tables across nodes. Through system programming, you can attach a node ID to non-redundant DNs, PhDNs, and Pilot numbers. This enables someone in one node to call an extension in another node without having to dial the node ID number. The caller dials the extension and the system automatically routes the call to the node where the called extension is located and rings the called extension.

Coordinated Numbering Plan

IP*edge* Net can be configured to allow users to call each other across network nodes with simple network directory numbers. This eliminates the user's need for access codes and network maps. Calls that encounter a busy or unanswered destination can be forwarded to any node in the network, including a centralized voice mail system or attendant.

Basic Call Control

IP*edge* Net conforms to the standard for Basic Call Control. This is the basis for all IP*edge* Net connectivity and interoperability with telephone systems from other manufacturers. Basic Call Control provides for connection, dialing, identification of calling and called parties' names and numbers and message waiting indications among other features.

**Note:** Toshiba does not guarantee interoperability with other manufacturer's products: only conformance to the standard.

Alternate Routing

Each system can be programmed for thousands of routing patterns for IP*edge* Net alone. This allows the creation of networks in which calls can be automatically re-routed around network disruptions. Centralized facilities and features can continue to work and users will be unaware of problems while they are being repaired.

Centralized Attendant

One attendant can serve an entire IP*edge* Net. Station users only need to dial "0" to reach the centralized attendant regardless of the node where they reside. The attendant can reach any station in the network using its

Network Directory Number. Trunks attached to any network node can be programmed to terminate to the centralized attendant and their source and calling party information is delivered to the attendant's display. The BLF appearances of all stations from all nodes can appear on the centralized Attendant Console.

| | |
|---|---|
| Telephone DSS Keys | Telephone DSS keys can appear across the IP*edge* Net network. This enables a user's DSS key to function in an IP*edge* network. The DSS function works within or across a network. |
| Centralized Voice Mail | Requires Stratagy ES or iES. A voice mail system attached to any IP*edge* network node can serve users throughout the enterprise. Unanswered calls will be forwarded to the voice mail, the source and calling conditions identified, and the appropriate voice mailbox greeting is played. The voice mail system can control message waiting indications throughout the network as messages are left and retrieved. A single network can even support multiple centralized voice mail systems with each station being programmed for the appropriate system. Record to voice mail and voice mail soft keys are available across all network nodes from a single Stratagy ES or iES voice mail system. |
| Enhanced 911 Feature | If a user enters the public emergency number, e.g., 911 in the U.S.; 110/119 in Japan; 999/112 in the U.K., the system treats it as an emergency call no matter what feature is invoked by the system interpreting the first part of the emergency number as an internal number. |
| Call Park Orbits | An individual orbit number is identical to PDN of an extension. To invoke and retrieve local Park from a station where # cannot be entered, enter the substitute access code.<br><br>The system orbit number needs to be previously stored as a part of Flexible Numbering Plan. |
| Enhanced 911 (E911 Interface) | If a user enters the public emergency number, e.g. 911 in US, 999/112 in UK, the system treats it as an emergency call no matter what feature is invoked by the system interpreting the first part of the emergency number as an internal number. |
| Speed Dial (System/ Station) | When the speed dial is programmed using an access code, regardless of the context of digit string, # is considered as the end, while * is recognized as an escape code. |
| Basic Survivability | DNs which can switchover are set to both primary and secondary servers.<br><br>Basically feature access codes, park orbits, and so on cannot have the same digits for both primary and secondary servers. However, without the same digits, this could cause switchover-customers some confusion because they may not know correct digits in the backup server. |
| PC Attendant | It is necessary to set feature access code (ordinary, 0) for Attendant group termination. |

| | |
|---|---|
| External ACD | It is not possible to set the same number of ACD Pilot DN as the other stations or feature access codes. |
| Private Network Numbering Plan | Node ID must be selected exclusively to IP*edge* System Station Numbering Plan to make a call by dialing the network station number instead of station number (Coordinated Numbering Plan). |
| Private Networking Over IP | IP*edge* Private Network Numbering Plan expands the restriction that the extension station number and feature access code shall be five digits maximum to that Network Directory Number shall be seven digits maximum and Feature Access Code shall be 11 digits maximum (except parameter). |