OVERVIEW   1-1

Class of Service
Class of Service (COS) is the mechanisms for assigning features and services to lines and stations within the system. The Class of Service for a given device, such as a station, is defined using 42 parameters. There are 32 Class of Service patterns available, each pattern can be set up to allow a unique combination of features. Each station and line group can be assigned independently to one of the 32 COS patterns.

The Class Of Service allows or denies a user to access a particular feature. It also determines to what degree the feature is available. A station (IPT/ SIP station/ SLT) and an attendant console have their own Class Of Service. With incoming calls, the Class Of Service is either assigned to a line on programming base or assigned (to a call) on a call by call basis.

Assignment of Class Of Service	
IPT / Attendant Console	Station (represented by PDN)
Standard Telephone, SIP Station	Station
SIP Trunk	Class Of Service is assigned to the Line Group.
IP*edge* Net	For IP*edge*, the traveling class mark is mapped to the Class Of Service and used on a call by call basis. If the traveling class mark is not available, the default value per Line Group is used. (See Networking feature for details)

Class Of Service Definition
The COS is used to check if a terminal or port is entitled to access the feature. The DRL is used by the Toll Restriction feature to check if the calling party is allowed to make a call to the dialed external destination. The FRL is used by the Station CO Line Access to check if the calling party is entitled to access the trunk facility. The QPL is used by the Automatic Callback feature and the Off Hook Camp On feature to determine the queuing priority of the calling party.

The COS is always referred against the configuration table, while the DRL, FRL, and QPL are referred with their numeric values. Thus, the numeric value of COS is just an index. In addition to the COS index, the station profile may be used to represent more detailed and complex information of allowance/denial of stations. As for the DRL/FRL/QPL, the larger value has higher priority than the smaller value. The COS has indexes 1 through 32 while DRL/FRL/QPL has levels 1 through 16.

The COS consists of the indexed COS and the profile. The indexed COS is an abbreviation of a set of available features and set up for administrative personnel to easily program stations. The profile contains flags or choices in addition to the indexed COS. The profile can be either a binary flag or a choice of three or more alternatives. The only difference between the index COS and the profile is whether they are grouped or not. There is no other distinction between these two.

The Feature button arrangement, iteration number, timer value, preferred destinations are considered as parameters but not as COS.

| Class of Service Override | Class of Service Override changes a station's class of service for one call. The temporary class of service is associated by programming with a Class of Service Override code. This makes it possible to originate an outgoing call from the station that is not permitted to make an outgoing call, or originate an outgoing call to a destination that is restricted. |

The user selects a DN button (PDN, PhDN) and dials a Class of Service Override Code while hearing a dial tone. The user will hear a dial tone again. The Class of Service of the station making the outgoing call is replaced by Class of Service associated with Class of Service Override Code, enabling the outgoing call or the call to the restricted destination.

If the original Class of Service of the station allows a feature which the Class of Service associated with the Class of Service Override code restricts, a user can use that feature. Those two kinds of Classes of Service have to be checked in "logical OR" manner.

For example, if a station is originally allowed to make an international call by its Class Of Service, when someone enters a Class Of Service Override code which restricts a user making an international call from that station, the international call is finally allowed because the original Class Of Service says so. If the input Class of Service Override Code does not agree with the one registered in the system, Reorder Tone is sent after the code is entered.

It is possible to set up to 16 Class of Service Override Codes in the system. The code is a string of numerals up to 8 digits long. Digits are numerals from 0 to 9 and exclude # and *. Class of Service Override Code is set by the maintenance station and it can be changed by a station enabled by Class of Service.

To change the Class of Service Override Code from the station, dial as follows:

- Class of Service Override Code change Access Code + Index (2-digit) + Old code + # + New code +#

The index is used to identify Class of Service Override Code. Even if the old code is wrong, a success tone or reorder tone is not sent until the new code is entered.

The Class of Service enabled by the input of the Class of Service Override Code is valid until the station becomes idle. Unlike Account Codes, the input Class of Service Override Code is not recorded in SMDR. It is not displayed on the LCD during dialing; "." (a period) displays instead.

Class of Service

The Class Of Service allows or denies a user to access the particular feature or determines to what degree the user is serviced. A station (IPT/SIP terminal/ SLT) and an attendant console have their own Class Of Service. Regarding an incoming call, the Class Of Service is either assigned to a line on programming base or assigned to a call on call by call basis.

The Class of Service consists of four specific parameters:

- Class of Service (COS) is used to check if a station or port is entitled to access a feature.
- Destination Restriction Level (DRL) is used by the Toll Restriction feature to check if the calling party is allowed to make a call to the dialed external destination.
- Facility Restriction Level (FRL) is used by the Station CO Line Access to check if the calling party is entitled to access the trunk facility.
- Queuing Priority Level (QPL) is used by the Automatic Callback feature and the Off Hook Camp On feature to determine the queuing priority of the calling party.

COS is used to check if a station or port is entitled to access the feature. DRL is used by the Toll Restriction feature to check if the calling party is allowed to make a call to the dialed external destination. FRL is used by the Station CO Line Access feature to check if the calling party is entitled to access the trunk facility. QPL is used by the Automatic Callback feature and the Off-hook Camp On feature to determine the queuing priority of the calling party.

The COS is always referred against the configuration table, while the DRL/FRL/QPL are referred with their numeric values. Thus, the numeric value of COS is just an index. In addition to the COS index, the station profile may be used to represent more detailed and complex information of allowance/denial of stations. As for the DRL/FRL/QPL, the larger value has higher priority than the smaller value. The COS takes indexes 1 through 32 while DRL/FRL/QPL take levels 1 through 16.

Class of Service

Class of Service Override

By dialing a Class of Service (COS) Override code, a user can change a station's set of privileges to one associated with the override code. When the call terminates and another is attempted from the same station, the original COS is applied. This allows selected users to override restrictions that are placed on any telephone in the system.

Perform Class of Service Override:

1. Access a Primary or Phantom DN. You hear a dial tone and the LED flashes at the in-use rate.

2. Press **#471**. The dial tone stops. Your LCD prompts you to enter a code.

3. Enter the COS Override Code (4 digits). You hear a dial tone.

4. Dial a telephone number.

Note: For security reasons, the override codes are only available on a selected basis. See your System Administrator.

PROGRAMMING

Classes of Service are the mechanisms for assigning features and services to lines and stations within the system.

Class of Service

1. Click on **System > Class of Service**.
2. Select the Server from the dropdown
3. COS Number – Select the COS Number.
4. Place a check mark in each of the services you want to allow.
5. Reset to Default sets all values to factory defaults.
6. Click on **Save** icon or select **Apply To** to assign the parameter to multiple servers.

A COS number is assigned in Station Assignments, Trunk Groups, and IP*edge* Net and can change per the Day1, Day2, or Night mode of the server.

Features affected by COS settings include: Auto Busy redial; Call Forward; Call Transfer; Do Not Disturb; Executive Override; Handsfree Override; Pickup; Through Dialing; Tandem CO Connection; Offhook Camp-on; Hook Flash; OCA; BGM; DNIS LCD Preference; Auto Page Disconnect; Invoke Emergency Page; Day/Night Control; LCR Access; Access to Trunks; and Account Codes.

Assign a COS or Network COS to a Station:

1. Click on **Station > Station Assignment**.
2. Place a Check to the left of the station to be programmed.
3. Click on **Edit** icon.
4. Click Advance configuration.
5. Set the COS for Day1, Day2, and Night as needed. Default is 1.
6. Set the Network COS if using IPedge Net. Default is COS 1.
7. Click on **Save** icon.

Assign a COS to an ILG:

1. Click on **Trunk > Trunk Groups**.
2. Place a Check to the left of the ILG to be programmed.
3. Click on **Edit** icon.
4. Click Advance configuration.
5. Set the COS for Day1, Day2, and Night as needed.
6. Set the Network COS if using IPedge Net. Default is COS 1.
7. Click on **Save** icon.

Class of Service Codes

Call Preference:

- Auto Busy Redial
- Call Forward Override
- Call Transfer with Camp-on

- DND Override - Calling Party
- DND Override - Called Party
- Do Not Disturb
- Remote Set/Reset DND
- Executive Override
- Executive Override Allowed
- Hands Free Override
- Privacy Override
- Join Feature

Operation Preference:
- Group Pickup
- Directed Station Pickup
- Directed Group Call Pickup
- Directed DN Call Pickup
- Ext Call Pickup
- Remote Retrieve Call Pickup
- DN Retrieve Call Pickup
- Through Dialing
- Tandem CO Connection
- DSS Override Call Fwd
- UCD Local Long-in
- UCD Remote Log-in

Phone Preference:
- Off hook Camp-on
- Allow Hook Flash
- Can Receive OCA
- BGM Enable
- DNIS LCD Preference
- Auto Page Disconnect

Privilege:
- Invoke Emerg Page
- Day/Night Control
- LCR Feature
- Trunk Access Allowed
- Forced Account Codes
- Verified Account Codes

Class of Service Override

1. Select **LCR/DR –> DR Guide**.

2. Select **Class of Service Override**.

3. For each Class of Service Override Index see:

    • Class of Service Override Code
      1 ~ 8 digits
      Blank = No code

CAPACITY	1. Levels of the COS = 32 (1-32)
	2. Levels of the DRL = 16 (1-16)
	3. Levels of the FRL = 16 (1-16)
	4. Levels of the QPL = 16 (1-16)

AVAILABILITY

The availability table below applies to COS Override.

Station/Line	Descriptions
IPT	Applied
Soft IPT	Applied
IP Attendant	Applied
SIP compliant station	Applied
SLT (via FXS gateway)	Applied
Paging Device via FXS gateway	Applied
SIP trunk	Applied
IP*edge* Net	Applied
ISDN trunk (via FXO gateway)	Applied
T1 trunk (via FXO gateway)	Applied
Voice Mail - MAS	Applied
Voice Mail - SIP	Applied

RESTRICTION

N/A

HARDWARE   No additional hardware is necessary for this feature.

FEATURE INTERACTION
Any feature addressed here is affected by Class of Service even though the specific description is not provided on the pages for the feature. As long as no specific description is provided, the Class of Service is used to check if the feature is allowed or restricted.

Account Codes
When an account code is verified, it is possible to originate the outgoing call with the outgoing class (FRL, DRL) which is already set. However, the outgoing originator class is referred if the outgoing trunk class is not associated with the Account code.

If the class previously associated with the account code is lower than the outgoing originator class (the allowable range is narrower), the outgoing originator class is referred. (This function is switchable by programming.)

Whether the originator requires a forced account code or not depends on the originator's Class Of Service (forced account code). However, it is necessary to set the seized trunk.

Whether the entered account code is verified or not depends on the originator's Class Of Service (verified account code).

Automatic Busy Redial (ABR)
Automatic Busy Redial availability to each DN is assigned by Class Of Service.

Automatic Callback (ACB)
Via the Automatic Callback feature, the originator with the higher priority (Queuing Priority Level) is connected to call the destination, if more than one originator is waiting for the same destination. If more than one originator has the same QPL level then FIFO (First In First Out) order determines which originator is connected.

Automatic Camp On/ Offhook Camp On
The Offhook Camp On feature must be enabled or disabled via Class of Service, "Offhook Camp On Permitted/ Not permitted," per the invoking station or line. This setting can be changed by Class Of Service Override feature during origination.

If more than one originator is waiting for the only camped on station, the originator with higher priority is connected per QPL (Queuing Priority Level). If there are originators who have the same QPL priority, the older originator is connected first. Refer the Class Of Service spec for QPL. Also, it is possible to change QPL during origination.

Background Music (BGM)
Only previous "Class Of Service" set at extensions are referred also for "Class Of Service for BGM Listening Through Station" when Class Of Service is changed using the Class Of Service Override feature.

However, when stations return to idle, permitted/ not permitted by Class of Service is checked before executing Class of Service Override. BGM will stop, after that, BGM listening resumes.

Basic Survivability	Set the same programming setting for both primary and secondary server.

Call Forward/System Call Forward	The terminating call forwarded by the Call Forward feature applies the Class Of Service of the forwarding party. Thus, changing Class Of Service of the originating party by Class Of Service Override feature has no effect for a forwarding call.

The exception is if Class Of Service of the originating party is applied to decide whether to disconnect the talking of the outgoing call or not, (not Class Of Service of the forwarding party), if the forwarding destination is the PSTN. In this case, Class Of Service which is changed by Class Of Service Override feature is used.

Call Forward/System Call Forward	When a call is forwarded, the Class Of Service of the forwarding party is referenced.

For an exception, when the destination is an outgoing trunk, Class of Service of the forwarding party is referenced if the disconnect timer is enabled.

The Call Forward feature does not work even if the owner station DN sets Call Forward registration if the destination DN sets Class Of Service of "Call Forward privilege."

Call Pickup	The picked up party's Class Of Service of "Whether to be picked up" must be enabled to invoke the Pick Up access code.

In addition to the above, the picking up party's Class Of Service must be enabled to invoke the following types of picking up.

- Group Pick Up
- Directed Station Pick Up
- Directed Group Pick Up
- Directed DN Pick Up
- Any External Pick Up
- Remote retrieve
- Directed DN retrieve

Call Transfer Immediate	When the call is transferred and the station becomes idle, Class of Service changed by Class of Service Override Code is disabled.

The transferring party's Class Of Service is checked when the transferring party invokes the Call Transfer Immediate feature.

Call Transfer With Camp On	The transferring party's Class Of Service is referenced by the call made by Call Transfer With Camp On. The QPL is that of the transferring party. When a Camp On call to the trunk is transferred, the DRL or FRL of the

transferring party is applied to the transferred call.

Call Transfer	When the call is transferred and the station becomes idle, the Class of Service changed by Class of Service Override Code is disabled.

To establish a tandem connection using the Call Transfer feature, the Class Of Service can be changed by entering Class Of Service Override access code. This is done when the transferring party puts the call on consultation hold and calls the destination.

To make Tandem connection by Call Transfer feature, Class Of Service of "Tandem CO Connection" of the transferring party is referenced. |
| Caller Identification | Whether ANI/DNIS information is prior displayed or caller information is prior displayed can be selected by setting of Class Of Service. |
| Class Of Service | The Class Of Service assigned to a station is overridden by the new Class Of Service specified through the Class Of Service Override feature for a particular call.

The Class of Service Override access code can be dialed from any station regardless of Class of Service. |
| Class of Service Override | The Class of Service assigned to a station can be overridden by a new Class of Service specified through the Class of Service Override feature for that particular call.

The Class of Service Override access code can be dialed from any station regardless of Class of Service. |
| Conferencing | Class of Service is applied when the conference master calls participants. |
| Day/Night Modes | Each station or port is programmed with the COS/DRL/FRL/QPL according to the DAY/NIGHT modes. Thus, each station or port may have a different COS/DRL/FRL/QPL for DAY1, DAY2, and NIGHT mode.

The user can enter the mode number after pressing the Night Transfer button, then the system changes Day/ Night mode if the IPT's Class Of Service is allowed. |
| Dial For Quick Launch | Class Of Service may be applied as the conditions of invoking per the type of feature by Dial For Quick Launch feature. |
| Direct Station Selection Button | Class Of Service controls follow (or override) the Call Forward setting when the station, in either the local or remote node which is associated with the DSS button, activates Call Forward or System Call Forward. |

The difference from Call Forward and System Call Forward is to add the control to follow Call Forward or System Call Forward only when the DSS button is pressed.

Do Not Disturb (DND)	Class Of Service of the setting party is referred to determine if local and remote setting of DND is applied.

Do Not Disturb (DND) Override — After entering the Class Of Service Override code, it is possible to change the Class Of Service (Whether to invoke Do Not Disturb Override).

Do Not Disturb (DND) Override/DND/ Busy Override — The Do Not Disturb Override feature can be invoked provided the following conditions are met.

- Set Class Of Service "Whether to invoke Do Not Disturb Override" of the Do Not Disturb Override invoker.
- Set Class Of Service "Whether to accept Do Not Disturb Override" of the Do Not Disturb Overridden party.

Emergency Page — Via the paging party's Class Of Service (Whether paging call is disconnected automatically or not) it is possible to disconnect the paging call after the preset time the paging call originated.

Whether the Emergency Page feature can be invoked or not is determined by the setting of Class Of Service (Whether to invoke Emergency Paging).

Emergency ring-down — Setting the originator's Emergency Ring Down determines if the originator can invoke the Emergency Ring Down feature.

Enhanced 911 (E911 Interface) — An E911 call can be originated even though the station is set not to originate an outgoing call.

Executive Override — The Class Of Service (Privilege as the originator of Executive Override) can change by entering the Class Of Service Override access code when the Executive Override invoker originates the call.

The following conditions are required to invoke Executive Override:

- Executive Override can invoke if Class Of Service "Privilege as the originator of Executive Override" of the barge-into party and Class Of Service "Allowed or not allowed as the overridden party of Executive Override" of the barged-into party are set as Enabled.
- Executive Override can invoke if Class Of Service "Privilege as the originator of Executive Override" of the barge-into party and Class Of Service "Allowed or not allowed as the overridden party of Executive Override" of all participants are set as Enabled.

External ACD	Classes Of Service regarding camping on are not applied for queuing on ACD Pilot DN. This is because queuing on ACD Pilot DN is not the same as camping on.
Group CO Button/Pooled Line Button	When the Class of Service Override feature is invoked the line button cannot be used for making a call.
	The trunk line may not be seized by the setting of FRL of both the originator and the trunk even if the user presses the GCO or Pool button.
	The user cannot originate an outgoing call by setting the originator's DRL even if the user presses the GCO or Pool button.
Group Paging	By the paging party's Class Of Service (whether the paging call is disconnected automatically or not) it is possible to disconnect the paging call after the preset time the paging call originated.
Join	The invoker's Class Of Service must be set as enable to invoke the Join feature.
Least Cost Routing (LCR)	The outgoing call by the Least Cost Routing feature can be used only if Class Of Service for LCR is set as enabled.
Line Group	The Class Of Service assigned to Outgoing Line Group may be referenced when an outgoing call to the public trunk originates.
	The Class Of Service assigned to Incoming Line Group is referenced when an incoming call from the public trunk terminates.
Manual Line Selection	The Class Of Service for Automatic Line Hold determines to automatically hold the call or to disconnect when the user hunts the line using the Manual Line Selection feature.
Multiple Calling	Class Of Service can be set on Multiple Calling pilot DN.
	The Multiple Calling pilot DN's Class Of Service is referenced instead of the originator's Class Of Service when the call is forwarded from Multiple Calling pilot DN to the other.
Networking	In a network environment, the Class of Service received from the far end is first mapped to the Class of Service which is locally defined and then evaluated on providing any service. Also, when IP*edge* sends out the Class of Service information, it is mapped to the Class of Service which is globally defined in advance.

OFF-hook Call Announce (OCA)	To terminate an OCA call, Class Of Service "Whether the destination station allows an OCA call " for the destination station must be enabled.
	To invoke an OCA call, the profile "Whether the originator can invoke OCA or not" for the originating station must be enabled.
	To originate an automatic OCA call, the profile "Automatic OCA setting in the originator" for the originating terminal must be enabled in addition to the two settings above.
Off-hook Camp On	When a call is initiated using Class of Service Override but the external line is busy, Off-hook Camp On can be activated. In this case, Class of Service associated with Class of Service Override Code is valid for the call initiated after Off-hook Camp On is retrieved.
	Whether Off-hook Camp On activation is permitted or not is determined by whether Off-hook Camp On is activated. This setting can be changed by using Class Of Service Override at origination.
	If more than one originator is camped on the same party, the system retrieves the call from the higher priority per QPL (Queuing Priority Level). If more than one originator has the same QPL, the system handles this in time series. For QPL, refer to Class Of Service.
Outgoing Call	To use trunk group access code, the originator's (station or ILG) Class Of Service "CoS of Trunk Group Access" must be set as "Allowed."
	The originator's (station or ILG) Class Of Service "Whether to disconnect the talking of outgoing call or not " must be set as "Enable" to release a call during an originated call to the PSTN.
PC Attendant	Each Attendant in Attendant group can set specific Classes Of Service.
Privacy/Non-privacy	The following settings must be "Permitted" to barge in the 2 way speech or the conference by Privacy Override feature:

- Class Of Service of Privacy Override invoker (Privacy Override privilege)
- Class Of Service of Privacy Override receiver (Executive/ Privacy Override Option)

Private Networking Over IP	When accessing the remote nodes features using the Network Feature Access Code, determine the Class Of Service depending on the node to provide service. When a feature such as Traveling Class Of Service is used, follow that feature's specifications. When such services are not used, refer to the default Class Of Service set on Line Group.
	Class of Service Override code is controlled closed at each node. It is possible to set the same code for the same contents in reference to two

more nodes for the programming convenience, but these codes are not particularly associated.

When the call with Class of Service Override Code entered is connected to a remote node via IP*edge*, the class of service associated with the Class Of Service Override Code is notified to the remote node.

By entering the Network Feature Access Code it is possible to dial the Class Of Service Override feature access code in the remote node. It is also possible to change the override feature access code in the remote node by dialing the Network Feature Access Code if the Class Of Service is allowed.

For an incoming call from a non-IP*edge* Net line and an outgoing call from a non-IP*edge* Net line, refer to the class of service set for each line group. As for an incoming call from an IP*edge* Net line and an outgoing call from an IP*edge* Net line, refer to the class of service at the originating and terminating nodes provided by Traveling Class Mark. For details, refer to Traveling Class Mark.

When accessing the features of other nodes using Network Feature Access Code, determine the Class Of Service depending on the node to provide service. When features such as Traveling Class Of Service are used, follow the specifications of that feature. When such services are not used, refer to the default Class Of Service set on Line Group.

Recall Treatment
When a transferred call recalls the station, the Class of Service changed by Class of Service Override Code is enabled. This applies only to the immediate recall, which takes place right after the party attempts to disconnect a call placed on Consultation Hold, and to long hold recall. Once the call leaves the station and returns as the recall, the override code becomes invalid.

Ring Over Busy
Ring Over Busy termination can be restricted by the destination's profile, whether to send Call Waiting Tone and Ring Over Busy enabled.

Ring Over Busy termination can be restricted by the destination's profileat hands free mode, whether to send Call Waiting Tone and Ring Over Busy enabled at hands free mode.

Ring Transfer
After the transferring party hangs up and Ring Transfer is invoked, Class Of Service is not referenced at connection because the transferring party's Class Of Service is referenced when the call is put on consultation hold and the transferred-to destination is called. However, Class Of Service of tandem connection is referenced.

SIP Extension
IP*edge* references the Class of Service of the party that rejects the call while processing the Rejected Call Forward call.

Speed Dial (System/ Station)	The System Speed Dial registration party must be permitted by Class of Service.
Specified Caller Identification	When MAS (FF PCH) or uMobility makes a call with specified caller number, IP*edge* determines whether the call is permitted by checking the Class Of Service (Profile). If the determination is "Reject," IP*edge* rejects the call and the caller hears Reorder Tone.
Station CO Line Access	After the user enters Class Of Service Override code, it is possible to change the Class Of Service (FRL as the originator) and seize the public trunk.
Station CO Line Access	Restriction to access Line Group by Station CO Line Access feature is done by comparing the originator's FRL to the Line Group's FRL.
Station Hunting	While using the Class Of Service Override access code while calling a hunt group pilot, the Class of Service Override remains in effect wherever the call terminates in the group. A Station Hunting pilot DN does not have Class Of Service. The selected destination member's Class Of Service is used when the call terminates on Station Hunting pilot DN.
Tandem CO Line Connection	A station can establish a tandem connection by the Call Transfer or Conferencing feature if the Class Of Service "Tandem CO Line Connection" is allowed. The IPT's LCD which establishes a tandem connection can display the status of tandem connection only if its Class Of Service allows invoking Executive Override feature. If not allowed, an idle screen is shown.
Through Dialing	For Through Dialing, the transferring station's Class of Service is referenced. Thus, you cannot dial an external destination for which a transferring station is not allowed. When another external destination call is attempted using Consultation Hold, after completing dialing by Through Dialing and going into conversation with the destination, the operator's Class of Service is referenced.
Toll Restriction Override by System Speed Dial	When Toll Restriction Override is restricted by the special Class Of Service but is allowed by the extension station's Class Of Service, the system will provide the service.
Toll Restriction	The DRL's Toll Restriction Table is used to restrict outgoing calls by the Toll Restriction feature.

Traveling Class of Service	The Class of Service assigned to a station can be overridden by a new Class of Service specified through the Traveling Class of Service feature for that particular call.
Universal Call Distribution (UCD)	Class of Service of Camp on is not applied for a camped on call to UCD. This means any Camp On features to UCD can be activated regardless of the caller's Class of Service.