

Surveillance Observation and Monitoring, ZO

DESCRIPTION



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1

GENERAL

1.1

DESCRIPTION

The Surveillance Observation and Monitoring, SOM, function comprises functions to observe and monitor traffic to or from certain objects for surveillance purposes. These objects can be individual extensions, group numbers, routes (trunk groups) or destinations in a private or a public network.

Monitored generic extensions will be forced to use gateway media and can therefore be used by SOM. IP DECT can be supervised but not integrated cordless DECT extensions.

The surveillance is controlled and administered from a Surveillance Control Center, SCC. The PBX is connected to the SCC via Monitoring Trunk Lines, MTLs, and a data link. The MTLs are used to carry monitoring information from observed objects in the MX-ONE to the SCC. The data link carries administration data and observation information for observed objects.

The SOM functionality of the MX-ONE is based on software. The SOM application keeps a data base with data of objects that are to be observed. All traffic associated with observed objects are intercepted and data are collected in the form of traffic events. The SOM also includes functions to monitor the observed object's speech channel. Observation data in the form of traffic events and monitoring information from the speech channel of the observed object, are then transmitted to the SCC.

Initiation of the data link, initiation of the MTLs, and assigning these to Monitoring Trunk Groups (MTG) are done from a PC client.

Once the necessary hardware and connections have been set up in the MX-ONE, all further operation and maintenance are done directly from the SCC. The SCC controls the SOM application via the data link by sending of Control Orders. These are received and executed by the SOM, which will send acknowledgments, status, and alarm messages back to the SCC in Control Messages.

The MTLs are based upon digital trunk lines, which are tied to the SOM application and mapped as MTLs by means of MML commands.

The data link is set up on two serial communication ports or on Ethernet Interface (TCP/IP) of a server in the MX-ONE. The data link can then be directly connected to the SCC or carried as semipermanent connections via the trunk line interface used for MTLs.

If the SOM detects an unauthorized access via a PC-client to the configuration of MTLs and the data link, a control message will be sent as an alert of an unauthorized access attempt.

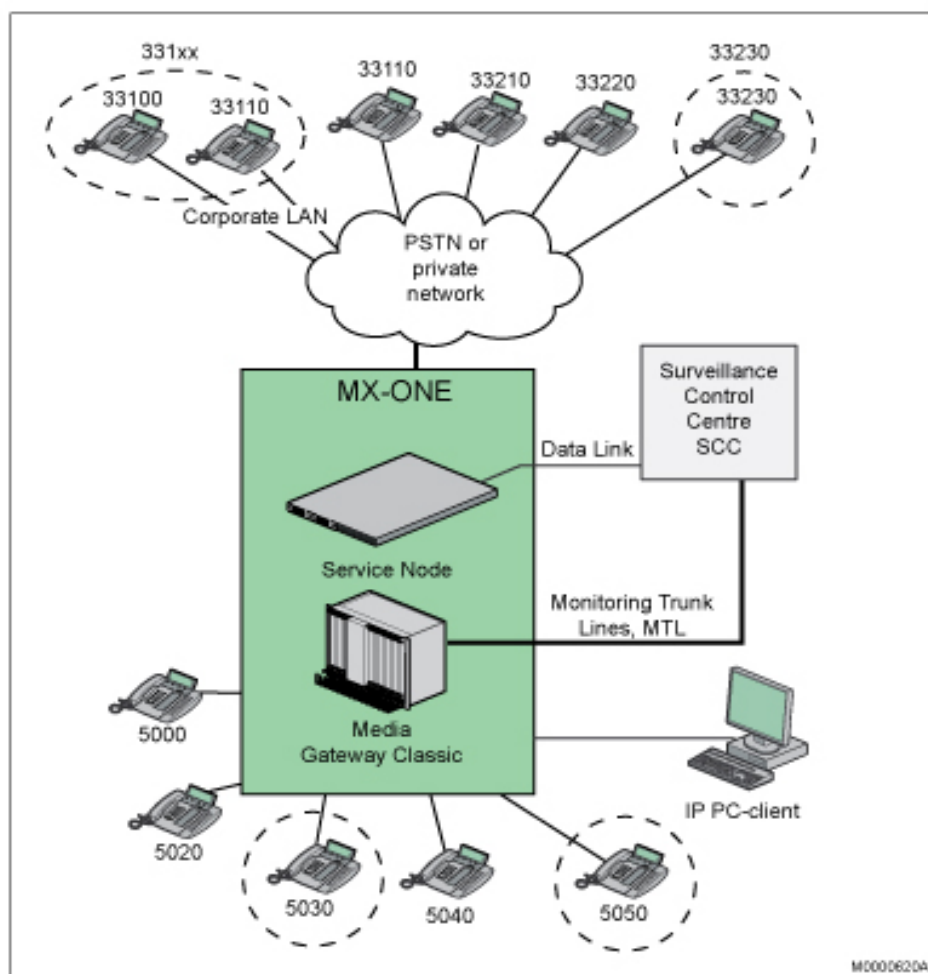


Figure 1: Overview of SOM

The figure gives a brief overview of the SOM application in the MX-ONE. A PC-client is used to set up the hardware necessary for the interface to the SCC. All further administration of the SOM and set up of object records are done from the SCC via the data link. The MTLs are used to carry voice information from monitored objects. The figure shows that object records have been defined for two internal extensions 5030 and 5050. Two object records have also been set up for two different external destinations, one complete 33230 and one incomplete 331xx (range of destinations).

Note: An MX-ONE Server with two V.24 serial ports or Ethernet interface (TCP/IP) is needed for the Data Link

1.2

ACRONYMS

CCL	Control Channel
DCE	Data Communication Equipment
ECL	Event Channel
MTG	Monitoring Trunk Group
MTL	Monitoring Trunk Line
ORN	Observation Reference Number

SCC Surveillance Control Center

SDN Surveillance Data Network

TLG Trunk Line Group

For further terms, see the description for *Acronyms, abbreviations and glossary*.

1.3

DEFINITIONS

Control Channel	A communication channel between the SOM and the SCC used for transmission of control orders and control messages.
Control Message	An information element sent from the SOM to the SCC. Includes status and alarm messages as well as responses to data requests from SCC.
Control Order	An information element sent from the SCC to the SOM. Includes orders for control and administration of the SOM as well as data requests.
Data Link	A communication link between the MX-ONE and the SCC for command and observation data, divided into a Control Channel and an Event Channel.
Event Channel	A semipermanent connection between the SOM and the SCC, used for transmission of event messages.
Event Messages	An information element sent from the SOM to the SCC. Contains information about traffic events of controlled objects.
Monitoring Trunk Group	A logical group of Monitoring Trunk Lines for either common or separate monitoring.
Monitoring Trunk Line	A trunk line used by the SOM to carry voice from monitored objects.
Object Record	A unique combination of an observed object and the surveillance characteristics.
Observation	Speech monitoring or event reporting or both is taking place on a call that involves one or more observed objects. An observation is created when a call involving an observed object is established and is ended when the observed object is disconnected from the call.
Observation Reference Number	A reference number that identifies each observation. Used in observation data sent to the SCC in order to distinguish data from different observations from each other.
Observed Object	The object for which observation has been requested. Can be an internal extension, a group number, a route (trunk group), or a destination in a private or public network. Set up as an object record.
Operation and maintenance password	A password used for protection against unauthorized use of the MML commands for the SOM hardware configuration.
SOM password	A password used for protection against unauthorized access to the SOM application via the data link.
Trunk Line Group	A group of digital trunk lines connected between the MX-ONE and the SCC.

2

FACILITIES

2.1

GENERAL

The observations can be divided into two main categories, statistical and complete. A statistical observation means that only event reporting is done for the observed object. A complete observation embraces both event reporting and speech monitoring.

When a call involves two or more observed objects, one observation for each observed object will take place. Events of the call will be generated for each observation individually and distinguished from each other by means of the ORN.

The SOM application keeps a data base with data of objects that are to be observed. All data in the data base will be erased when the SOM functionality is deactivated.

The SOM functionality of the MX-ONE is invisible for the observed object.

The SOM functionality is license controlled. The number of licenses required to use the functionality is equal to the number of LIMs in the system.

When one or more LIM is added to the system, SOM licenses are checked. If the number of available licenses is less than the number of LIMs in the system, the connection to the SOM application is closed and a message is sent to the application.

The user should order new SOM licenses and re-initiate the SOM application.

2.2

EVENT REPORTING

Event reporting means that different traffic events for an observed object is recorded and reported to the SCC on a real time basis. Depending on observation category, object type and the particular event (traffic case), the event message can contain information about identity of calling and called party, type of numbers and type of involved parties, usage of additional services, observation priority and associated MTLs.

2.2.1

POSSIBLE EVENTS WHEN THE CONTROLLED OBJECT IS THE CALLING EXTENSION

COMPLETE NUMBER DIALLED

This event is generated when a complete number has been dialed from an observed extension and the called party has been seized (ringing) or if the called party is engaged (busy message). If the called party is external, this event will be generated after an end-of-selection message has been received. For complete observations this event is generated after seizure of MTLs.

ANSWER

This event is generated when the called party answers and speech state is entered

DISCONNECTION

This event is generated when either a party in a conversation clears down the call, or when the calling party clears down before answer (ringing), after reception of a busy message, after reception of a no progress message, or before a complete number has been dialed.

ADDITIONAL SERVICE

This event is generated when an observed object has successfully initiated or canceled an additional service or when an additional service is invoked.

2.2.2

POSSIBLE EVENTS WHEN THE CONTROLLED OBJECT IS THE CALLED EXTENSION

COMPLETE NUMBER DIALLED

This event is generated when a complete number has been dialed and the called party is an observed extension which is either free (ringing) or engaged (busy message). For complete observations this event is generated after seizure of MTLs.

ANSWER

This event is generated when the called party answers and speech state is entered

DISCONNECTION

This event is generated when either a party in a conversation clears down the call or when the calling party clears down before answer (ringing) or after reception of a busy message.

ADDITIONAL SERVICE

This event is generated if an additional service is invoked during the call to the observed extension.

2.2.3

POSSIBLE EVENTS WHEN THE CONTROLLED OBJECT IS A NETWORK DESTINATION OR ROUTE

COMPLETE NUMBER DIALLED

This event is generated when a complete private or public destination, that is set up as an observed object, has been dialed. The event is generated when an end-of-selection message has been received.

ANSWER

This event is generated when an answer message is received and speech state is entered.

DISCONNECTION

This event is generated when either the calling party clears down or when a clear signal is received.

2.3

SPEECH MONITORING

Speech monitoring implies that a listening path is established to the speech connection of an observed object. Speech information from the monitored call is then transmitted via an MTL to the SCC. Monitoring is established automatically when the observed object enters speech state if the observation category is a complete observation. Monitoring can also be ordered manually from the SCC for any observed extension in speech with statistical observation.

SEPARATE MONITORING

Separate monitoring means that the A- and B-party are monitored separately on different MTLs.

COMMON MONITORING

Common monitoring means that both parties of a conversation are monitored simultaneously over the same MTL.

3 HARDWARE

3.1 DESCRIPTION

The surveillance is controlled and administered from the SCC. The PBX is connected to the SCC via Monitoring Trunk Lines, MTLs, and a data link.

The MTLs are used to carry monitoring information from observed objects in the MX-ONE to the SCC. MTLs are based on digital trunk lines.

All data communication between the SCC and the SOM are done through a semipermanent data link. The data link is divided into two data channels, denoted Control Channel and Event Channel, hereby referred to as CCL and ECL.

The two channels of the data link are connected to the MX-ONE through two V.24 or Ethernet (TCP/IP) ports.

The two channels of the data link are then connected to the SCC via a Surveillance Data Network (SDN). This network is realized using either equipment for connection to a public or private switched data network, or multiplexed into and carried by two MTLs between the SOM and the SCC.

Only one data link per system can be defined. If the data link becomes faulty, the communication between the SOM and the SCC will be stopped completely.

3.2 INTERWORKING

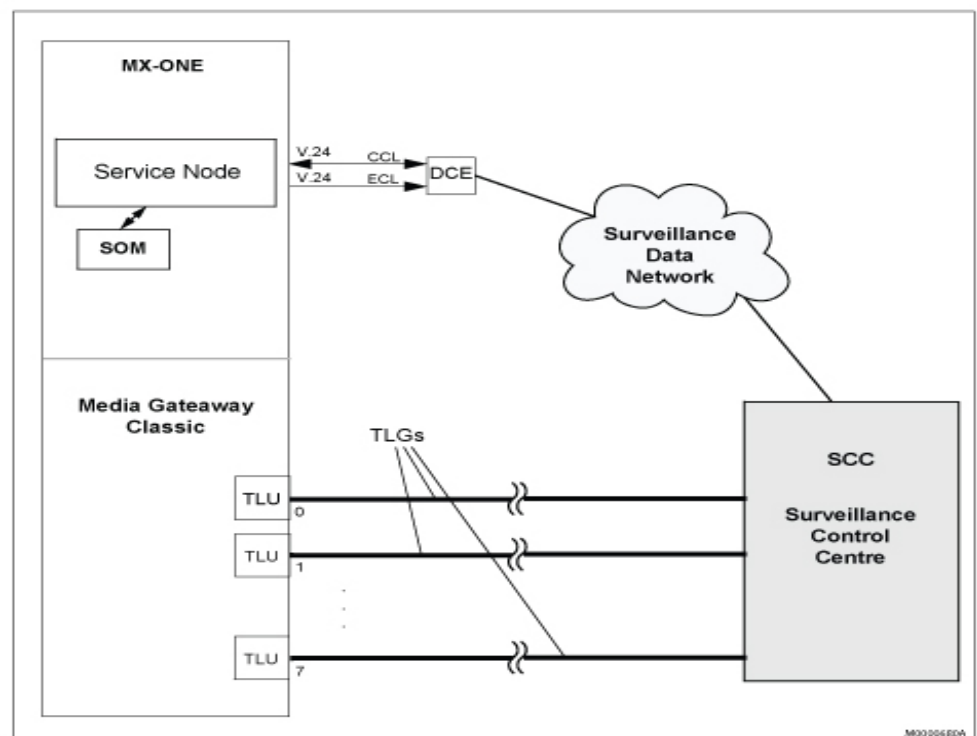


Figure 2: Interfaces between the SOM and the SCC

The figure shows a connection between the SOM and the SCC consisting of 8 TLGs, each one a first order PCM-link.

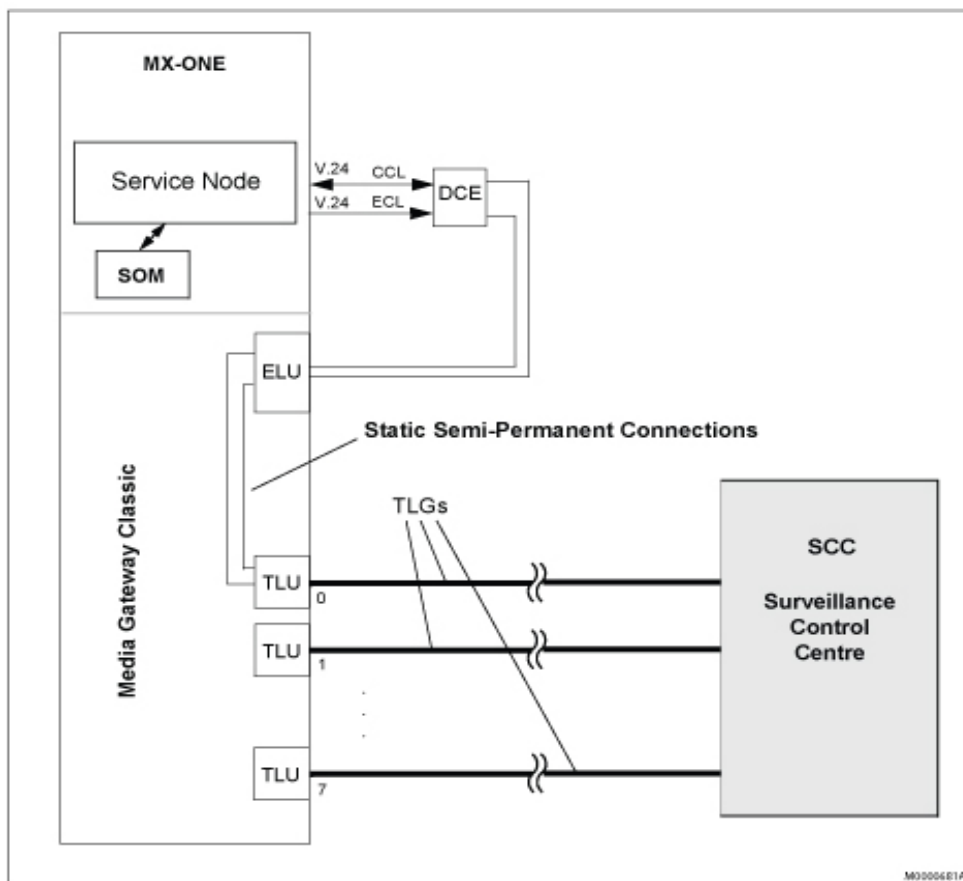


Figure 3: Interfaces between the SOM and the SCC

The figure shows a connection between the SOM and the SCC consisting of 8 TLGs, each one a first order PCM-link. The data link is established using modem lines carried by the first TLG.