

भारत सरकार Government of India
रेल मंत्रालय Ministry of Railways
रेलवे बोर्ड (Railway Board)

No. 2020/Tele/9(2)/1_01

Dated 10.04.2024

PCSTE,
All Indian Railways.

**Sub: IRISSET Report on the Implementation of Additional Features on RExCS
(Railway Exchange Configuration System).**

Ref: IRISSET's letter no. Asterisk/Corr/RB/2024 Dated: 12/03/2024

Based upon the requirements of additional features on RExCS from Zonal Railway, IRISSET has already developed many modules in RExCS. Solutions/Replies to facilities/issues raised by Railways have been given by IRISSET and its team. Detailed reply as received from IRISSET is hereby attached for implementation and utilization by Zonal Railways.

DA: As above.

Signed by

Ashish Kumar Singh

Date: 16-04-2024 10:14:52

(Ashish Kumar Singh)

Joint Director/Telecom

Railway Board

Ministry of Railways

Tele: 011-47843072

e-mail: dtele2@rb.railnet.gov.in

5. Issues Raised by NWR

SN	Issues raised by N.W.Rly	Remarks by IRISET
1	<p>Load Sharing at Servers- Approximate subscribers in NWR/HQ offices is 1800. Four servers are being used, two as main servers and other two as their redundant servers. All subscribers programming is being done in only one main server because Asterisk based IP exchange does not support load sharing as shown in website www.rexcs.railnet.gov.in.</p>	<p>Asterisk offers various load-sharing modes within a clustered architecture. The approach chosen by the committee nominated by the Railway Board is to use 1:1 redundancy with no load sharing. This simplifies the overall exchange setup. Further, the switching from one server to the other is done by the phone and is not done by the server. This approach makes the configuration of the exchange servers even simpler. Having decided that the exchange will be maintained in-house, it is important that the setup is modular as well as simple. The specification has also been drafted containing COTS servers with minimal configuration. RExCS will support this methodology of redundancy.</p>
2	<p>After every 1500 extension there is a new server for balance users but feature like-Call forward, auto Call back, Call pickup, follow me, Call conference do not work between subscribers who are on different servers. The servers do not work as a unified single server as Server is connected to another Server using PRI.</p>	<p>RExCS supports three types of numbers - Intercom, Railway, Byte. RExCS specifies that an Intercom should not span the boundary of one server. With this arrangement, the implementation of the various features mentioned by NWR is easy. Call Forward, Call Pickup and Parallel Phone features have already been developed and are included in RExCS. Zonal Railways can make use of these features by updating their Asterisk Exchange through RExCS.</p> <p>Also work is going on for developing</p>

		<p>features like Call back, Call Park and Voicemail. These features also will be included in RExCS so that it will be available for users. TDC is 15/3/2024.</p> <p>It is however informed that these features can be made to work in Asterisk even across multiple servers using advanced configuration. Since we have only limited resources to work on Asterisk, Implementation of these advanced configurations is not being taken up now. Moreover the Asterisk team is also involved in helping the zonal railways for the implementation of asterisk based exchanges in addition to developing new features.</p>
3	<p>Redundant Server - On failure of main servers all IP phones will not work. Manual changing of Ethernet cable from main server to redundant server will be done. Only then the IP phone will work. Asterisk does not support Hot Standby feature among Servers. Moreover, manual intervention is required for changeover.</p>	<p>As per the guidelines issued by RB, every Asterisk based IP Exchange should have a Main Server and redundant Server and its IP Address is being configured in the SIP phones. Incase if Main Server is not available for setting up a call, the session will get established with the help of a redundant server and this doesn't require manual change over. The feature is already provided in RExCS. In case, NWR has set up a system where they are using manual changeover, the Asterisk team will guide the officer/SSE and they may be sent to IRISET to appreciate the method of using redundancy available in RExCS.</p>

4	<p>Boss and Secretary system- In this IP exchange call from Secretary IP phone after 08 ringback tones is being transferred automatically to Boss IP phone which is only suitable for SAG officers. However in PHODs & above cases, all calls must mature on Secretary IP phone. Only with permission of Secretary, call should be transferred to IP Phone.</p>	<p>This feature has been made available through the RExCS. Zonal Railways can make use of this feature by updating their Asterisk Exchange through RExCS.</p>
5	<p>Busy Lamp Field (BLF)-BLF function does not support in Asterisk based IP Exchange. Busy lamp field is a presence indicator that allows you to see who is available (or not) for a phone call at any given time. This function also play a vital role in Boss-Secretary and hierarchy based systems like us.</p>	<p>Asterisk supports BLF function. The configuration generated by RExCS already supports BLF.</p> <p>The support for BLF also depends on the compatibility of IP phones. The specification of IP phones issued for VoIP exchange takes care of this feature. If NWR has purchased IP phones as per the issued specification, BLF is supposed to work. The IP phone has to be configured accordingly.</p> <p>It may however be noted that the BLF functionality has been enabled only for the Intercom numbers. For other numbers, it is actually not required.</p>
6	<p>Auto call back or Camp-ON:- If the dialled number is busy, then the caller may relax after pressing the camp-on button. When dialled subscribers will be free then there will be a ring back on the caller's IP phone. After picking the callers IP phone then there will be a ringtone to a dialled subscriber. Currently this facility is not available in this IP exchange.</p>	<p>Asterisk has the feature of call-continuation which is used for "auto call back" or "camp-on" features of other traditional exchanges. This feature has been developed and is made available in RExCS. *30 is the code for initiating a call-continuation and *31 is the code for cancelling a call-continuation. It must however be used with care. The feature is</p>

		planned through a dial code as different makes of IP phones are required to work with the exchange in an open manner. Further, it is felt that this feature may not be very relevant with IP phones as the phones show the missed calls.
7	Call Detail Record: Call Detail Record (CDR) showing originating phone number, destination phone number, duration of calls etc is not available.	Asterisk provides a comprehensive Call Detail Record (CDR) system that records information about calls, including originating phone number, destination phone number, call duration, and other relevant details. It is available as a comma separated file on the server. As Railways do not use CDR as such, GUI for displaying CDR was not done as it will be an unproductive use of resources. However, if required by most of the Railways, this development can be planned.
8	IVR & Service Messages: Interactive Voice Response (IVR) is an automated phone system technology that allows incoming callers to access information via a voice response system of pre recorded messages without having to speak to an agent. On the various occasions, pre-recorded voice messages are required to be play on dial tone or ring back tone. This feature is not available.	Asterisk provides IVR & Service Messages. It has one of the most versatile IVR systems in the world which is easily programmable. IVR & Service Messages are mostly used by Business entities, Call Centers, Customer Support, Telecom Service Providers etc. The requirement of these features for Railways Telephone Exchange is neither specific nor clear. However, if required by most of the Railways, this development can be planned.
9	Route by caller ID: In this system caller can ring to direct to Boss without ringing via Secretary. Based on caller ID, call can be made to land	Route by caller ID as well as choosing specific dial plan based on the caller-ID is very much available in Asterisk. It has not been provided

	at Boss extension without ringing at Secretary	in RExCS. NWR may kindly specify the use-case scenario where the route by caller ID will be required so that the same can be incorporated in the RExCS GUI.
10	Voice mail facility is not available.	Again, Asterisk has one of the most versatile Voice mail facilities. Voice mail feature is mostly used by Small to Medium-Sized Businesses (SMBs), Call Centers, Enterprises, Healthcare Providers, Customer Service etc. It has not been enabled through the RExCS GUI as most of the personnel use whatsapp for short information, even voice. The voice mail facility offered by Telos is also not being used now. Under such a scenario, it is felt that developing a GUI for enabling voice mail features of Asterisk is unproductive. However, the team is working on developing the voice mail facility and including the same in RExCS. TDC: 15/3/2024
11	Pick up a call ringing on another phone is not available.	This feature is available in Asterisk and is now included in RExCS. Zonal Railways can make use of this feature by updating their Asterisk Exchange through RExCS.
12	FXO-line mapping on desired number. Single IP phone can be used for dialling and incoming of other service provider's telephone number. This feature is not available.	This feature has been implemented using Asterisk and the same has now been included as a feature in RExCS. Zonal Railways can make use of this feature.
13	LDAP Directory-(Lightweight directory access protocol) LDAP directory is maintained at server but	The LDAP facility has to be used by the Phones to query a LDAP server for the directory. RExCS can

	<p>this directory will be available on IP phone connected to servers i.e. no need to make a directory on individual IP phones. This feature is not available.</p>	<p>configure the LDAP servers so that phones can pick up the directory from the LDAP server. For this, the specification of the VoIP phones will have to be changed.</p> <p>In ECR, the directory of the phones are loaded using HTTP and not LDAP. The HTTP file for directory is generated by the configuration tool. HTTP is simpler and can be used for this purpose.</p> <p>This is a good feature (either LDAP or HTTP) that will simplify maintenance. However, the IP phone vendors will have to be consulted for the same and its interoperability with other different vendors will have to be examined before effecting a specification change.</p> <p>IF NWR has done some work in this regard, the same may be shared.</p>
14	<p>Parallel IP Phone-Two IP phone with same numbers is not possible in Asterisk.</p>	<p>It is not clear why we would like to provide two phones with the same number. NWR may kindly provide the use-case scenario where this facility is proposed to be used.</p> <p>It is not clear why we would like to provide two phones with the same number. The correct method for doing this is to have two phones with different numbers say A and B. Another virtual number should be created, say C, to make both the phones ring together. Such configuration is very much possible in Asterisk.</p> <p>(It is like a group calling i.e two</p>

		<p>more subscribers can be grouped and assigned one calling number for that group that acts like a parallel connection).</p> <p>This has been implemented in Asterisk and this feature is now made available through the RExCS. Zonal Railways can make use of this feature by updating their Asterisk Exchange through RExCS.</p>
15	<p>Hierarchical QoS services like priority to a subscriber, Call barring, Call recording etc. features are not available.</p>	<p>With such a versatile dial plan, Asterisk supports all these features. NWR may kindly provide the use-case scenario where this facility is proposed to be used so that IRISET can take a decision for incorporating it in RExCS.</p> <p>QoS is a feature of the network for giving priority to IP traffic in that network and can be configured in L2, L3 switchers, Routers and Firewalls of network devices. VOIP traffic can be prioritised if required.</p>
NA	<p>In addition to above, in near future IPMPLS, MTRC, LTE, VOIP based TCCS etc shall be introduced in Railway. These services shall be connected through an IP-exchange server using a compatible gateway server. Again the problem of seamless connectivity, exists in Asterisk, will restrict the bringing of all services at one platform, as it does not support unified communication system functionality.</p>	<p>NWR to clarify when standard SIP technology is being used in Railway VoIP exchange and with most of the modern Telecom system moving to SIP, what type of problems are envisaged so that the same can be studied and appropriate decisions taken at the policy level.</p> <p>The MPLS, MTRC, LTE are the different types of transport networks and VOIP is a service to be transported. If any bandwidth problem is there in the transport network, every service will suffer not only VOIP. Their QoS can be</p>

		configured for VOIP traffic.
NA	<p>Two large exchanges i.e. NWR/HQ & JP divisions are in an advanced stage of commissioning but could not be commissioned due to restricted features as stated above. In view of above and as per item no.B.4 of ref (iii), it is advised to take necessary action for providing above facilities in Asterisk based IP exchange in a time bound manner.</p>	<p>The Asterisk team stands with NWR in supporting the commissioning of its Asterisk exchanges as per the guidelines of Railway Board. It is opined that NWR can go ahead with their commissioning with the available features in RExCS. In case, decisions on more features are taken, it will become subsequently available to NWR as well.</p> <p>It is reiterated that RExCS is an attempt by the Railway Board to make the Railways VoIP exchange easily maintainable and bring in uniformity, reduction in maintenance cost of exchange, remove vendor-lock in for telephones, move away from the licence regime and escape over-dependence on exchange OEMs.</p> <p>ECR is using Asterisk based exchange in its GM Intercom spread over the zone, zonal HQ exchange, SEE division HQ exchange and all the exchanges on DHN division. In case of any difficulty, ECR can also be consulted.</p>