

Exit Router T1 Link Sizing

There is a somewhat-outdated Excel spreadsheet that shows the number of T1s needed in an Exit router based on the number of simultaneous interzone calls. It does not provide actual bandwidth calculations but serves as a “sizing” tool for system design. Recall previously I made note that an Exit router supports 4 T1s used in aggregation for network transport.

This first calculation shows the interzone link between zone-1 (Washington County) and zone-4 (CM Regional Logger). The result of 5 simultaneous analog channels (e.g. VHF system overlay) and 25 simultaneous Digital Channels (trunked talkgroup calls) requires at least 2 T1s for supported operation.

Zone Pair Z# - Z#	InterZone Link Name	DSR Zone Link ?	# Analog IZ Chans	# Digital IZ Chans	Additional BW Kbps	# T1/E1's
1 - 4	Connection 1	No	5	25	224	2 T1

Doubling the quantity of both the Analog channels to 10 and Digital Channels to 50 reveals the following:

Zone Pair Z# - Z#	InterZone Link Name	DSR Zone Link ?	# Analog IZ Chans	# Digital IZ Chans	Additional BW Kbps	# T1/E1's
1 - 4	Connection 1	No	10	50	224	3 T1

This calculation requires at least 3 T1s for supported operation.

Doubling the counts again to 20 and 100 respectively:

Zone Pair Z# - Z#	InterZone Link Name	DSR Zone Link ?	# Analog IZ Chans	# Digital IZ Chans	Additional BW Kbps	# T1/E1's
1 - 4	Connection 1	No	20	100	224	3 T1

Still a minimum of 3 T1s to support this configuration.

Lastly, increasing the number of Digital calls to 200 shows 4 T1s needed.

Zone Pair Z# - Z#	InterZone Link Name	DSR Zone Link ?	# Analog IZ Chans	# Digital IZ Chans	Additional BW Kbps	# T1/E1's
1 - 4	Connection 1	No	20	200	224	4 T1

Conclusion

In summary, in the very slim chance that the ARMER system is passing 200 simultaneous calls across the interzone links between zones 1 and 4, whether they be Washington County talkgroups destined for the regional logger or actual interzone dispatch/radio calls, the Exit routers in each of the zones have more than enough T1 link capacity to meet the demand.

I have investigated this thoroughly and have come away with the understanding that given the large size of the ARMER system and conversations with Motorola engineers, there’s virtually no amount of interzone-generated network traffic that can cause a symptom of lost audio or outages. Allowing Washington County to become a member of the CM regional logger should proceed without concern as it applies to Interzone link bandwidth usage.