

APPENDIX D: PERFORMANCE v. TRAFFIC RATE

This appendix contains results graphs for the simulation study. The graphs present the measured performance of the network at the sixth and eighteenth hours as the traffic rates increase. The performance criteria presented is only for the sixth and eighteenth hours, 0600 and 1800 Universal Time (UT), and is not a composite of previous hours.

Each page of graphs is for the same sounding scheme and the same propagation condition. Results for propagation conditions 1, 3, 5, and 8 are presented, see Table 4. Sounding frequencies presented are in order beginning with the baseline (no sounds) case, followed by sounds scheduled on the network every 15, 10, 6, 3, 2, and 1 minute(s).

The vertical scales for link and call success represent rates, between zero and one inclusive. The vertical scale for the average delay graph represents minutes. The horizontal scale represents the traffic rate in messages per hour.

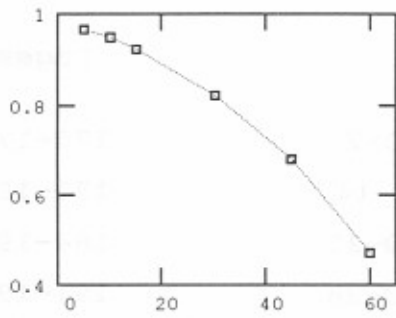
A more detailed description of these results graphs along with interpretations and results is given in Section 4.2.1.

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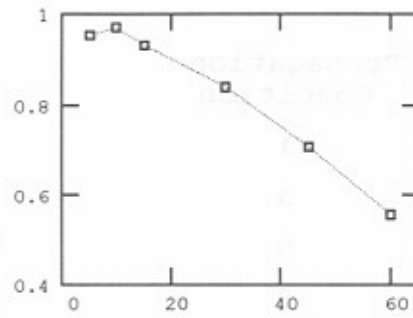
Propagation Condition	Figures	Pages
1	D-1 through D-7	170-176
3	D-8 through D-14	178-183
5	D-15 through D-21	184-190
8	D-22 through D-28	191-197

0600 UT

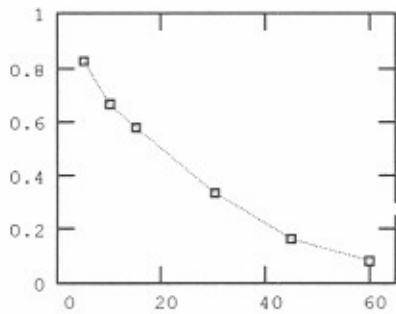
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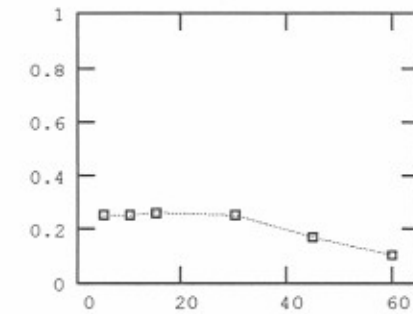
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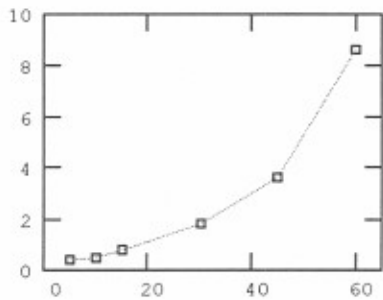
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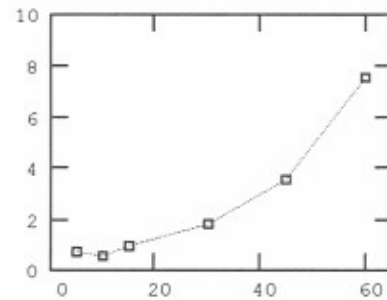
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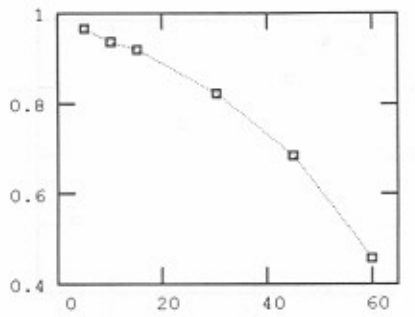
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Delays in minutes.

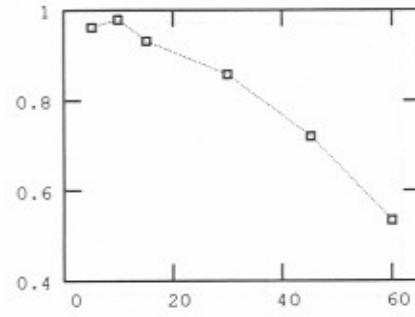
Figure D-1. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, 30, 45, and 60 messages per hour - propagation condition 1 - no sounds.

0600 UT

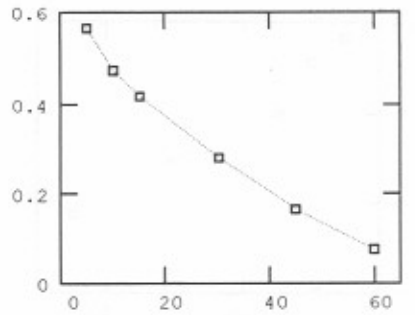


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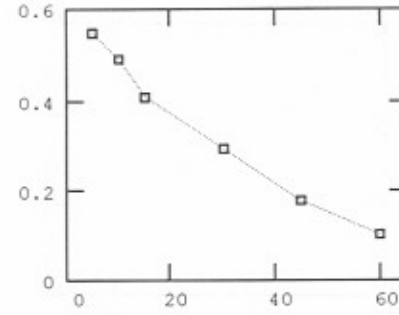
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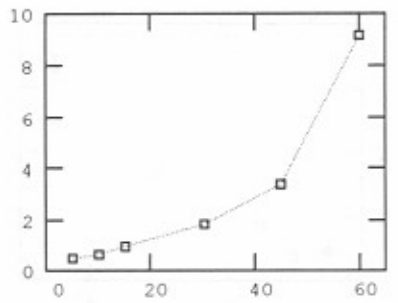
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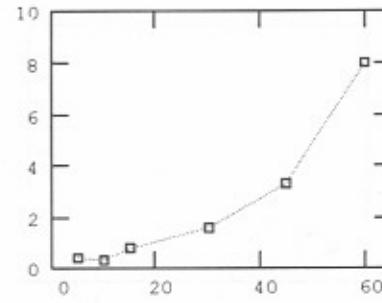
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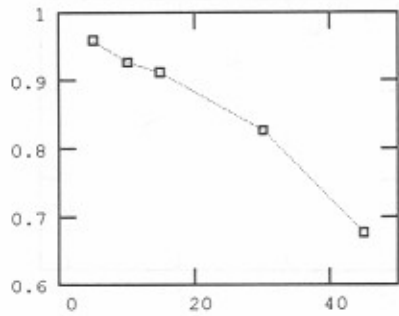
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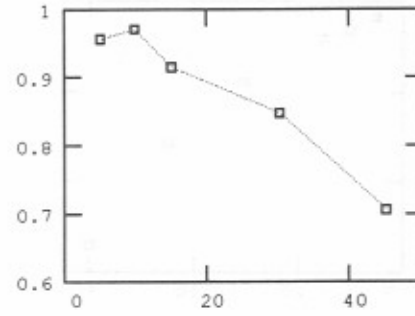
Figure D-2. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, 30, 45, and 60 messages per hour - propagation condition 1 - sounds scheduled every 15 minutes.

0600 UT

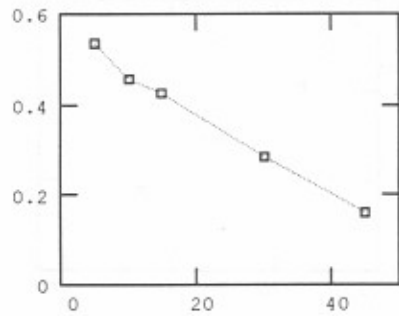


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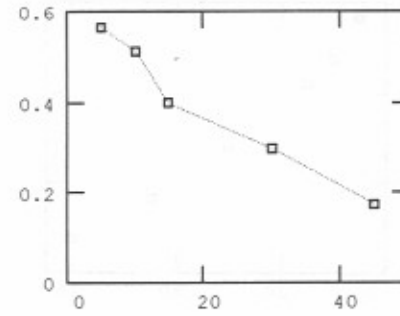
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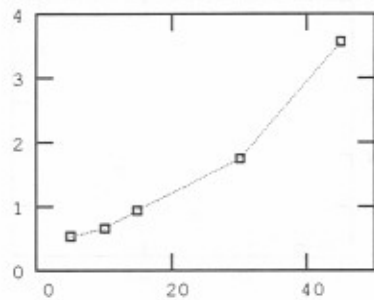
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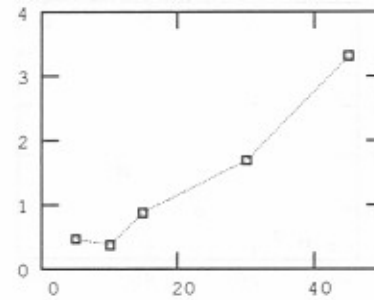
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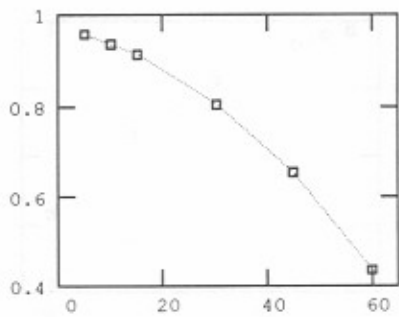
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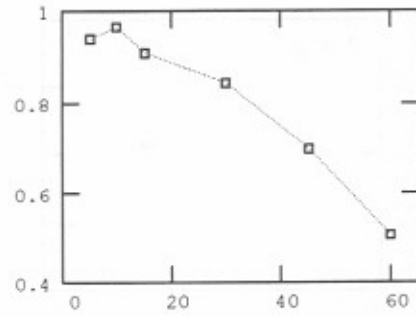
Figure D-3. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, 30, and 45 messages per hour - propagation condition 1 - sounds scheduled every 10 minutes.

0600 UT

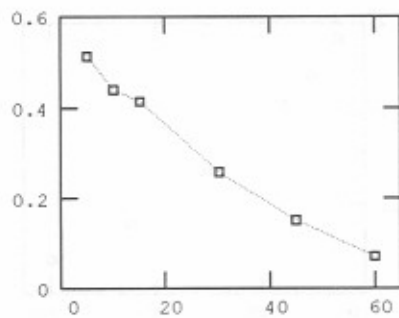


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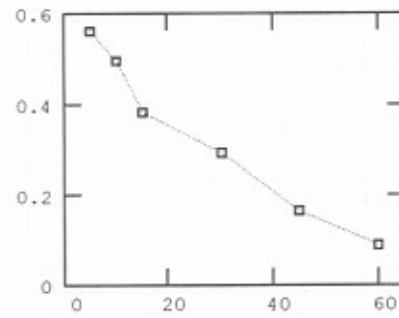
1800 UT



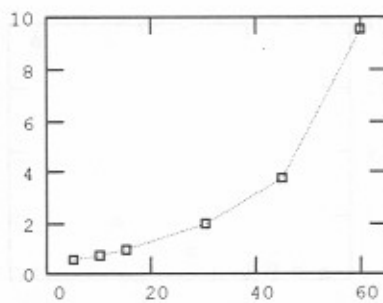
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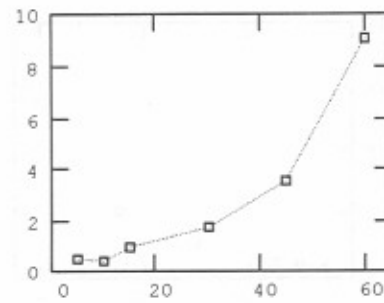
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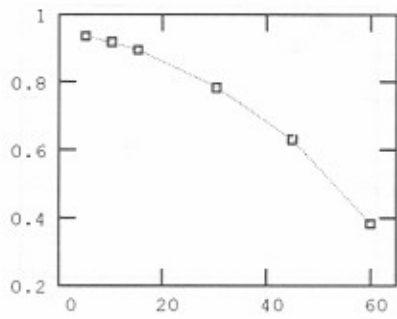
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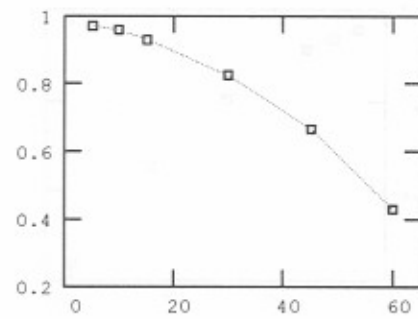
Figure D-4. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, 30, 45, and 60 messages per hour - propagation condition 1 - sounds scheduled every 6 minutes.

0600 UT

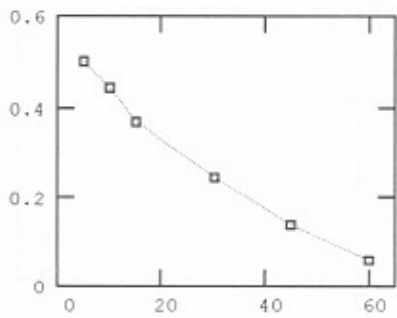


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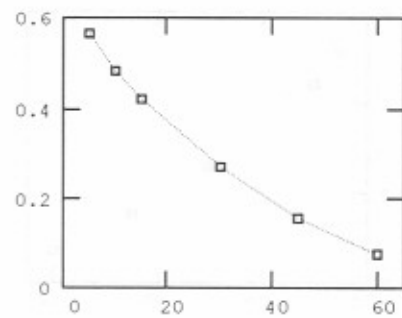
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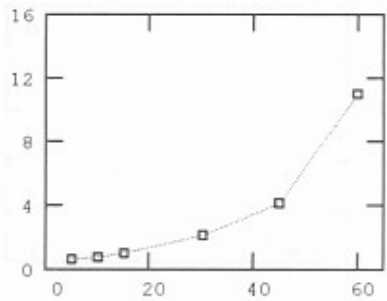
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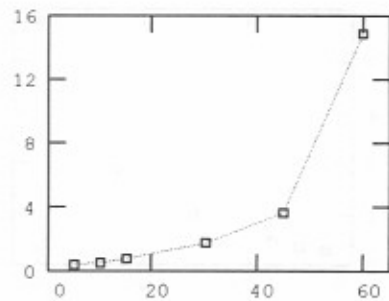
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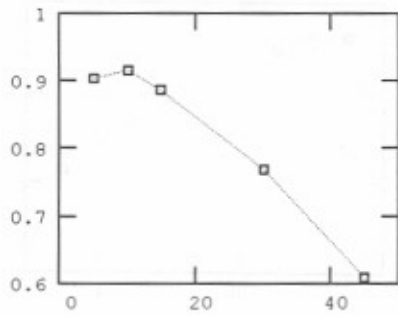
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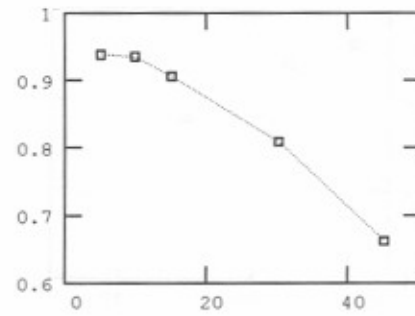
Figure D-5. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, 30, 45, and 60 messages per hour - propagation condition 1 - sounds scheduled every 3 minutes.

0600 UT

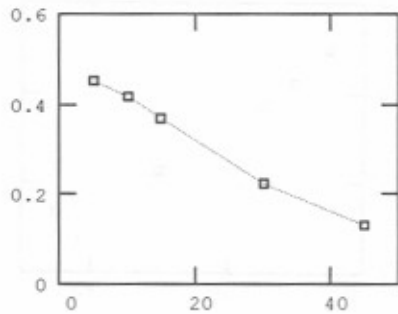


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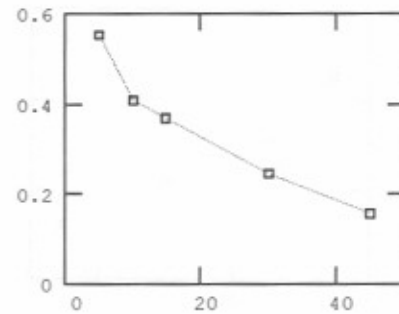
1800 UT



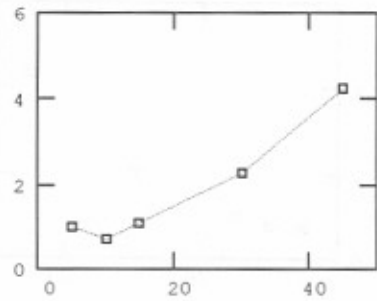
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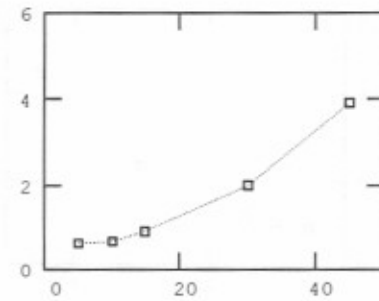
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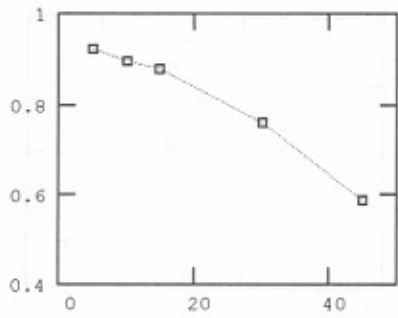
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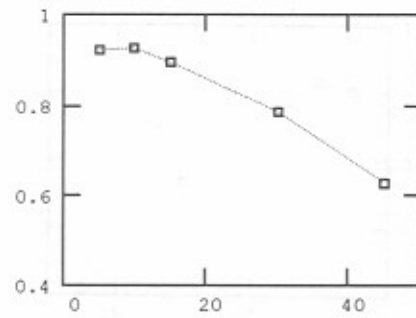
Figure D-6. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, 30, and 45 messages per hour - propagation condition 1 - sounds scheduled every 2 minutes.

0600 UT

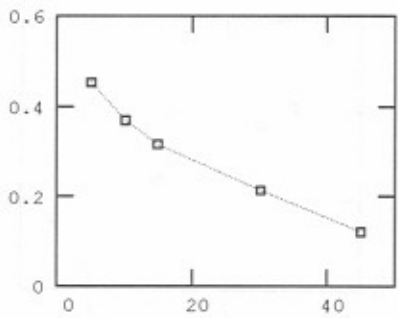


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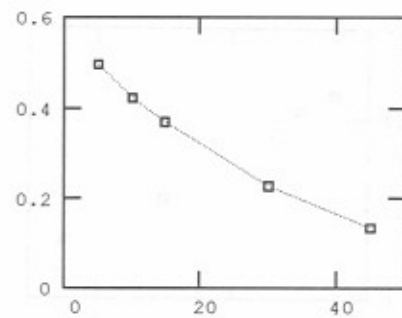
1800 UT



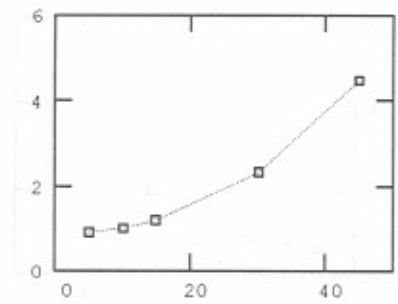
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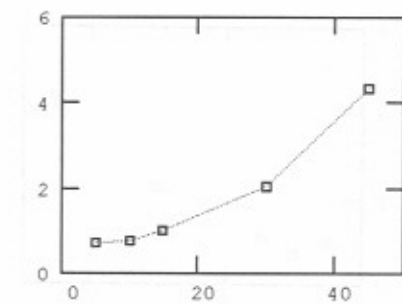
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Call success rate.



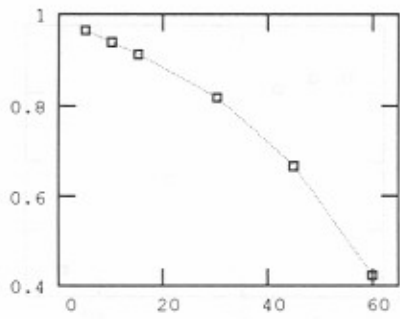
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Delays in minutes.

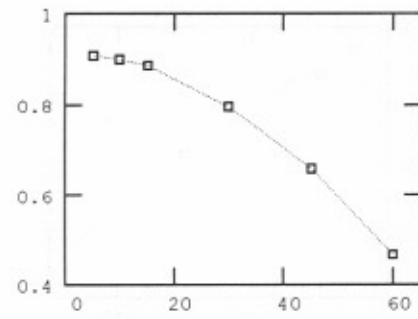
Figure D-7. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, 30, and 45 messages per hour - propagation condition 1 - sounds scheduled every minute.

0600 UT

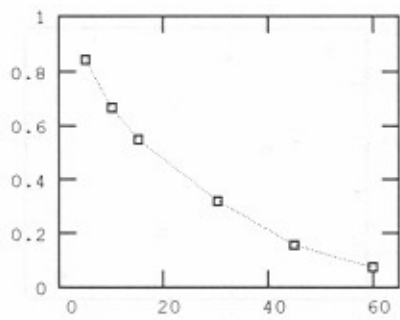


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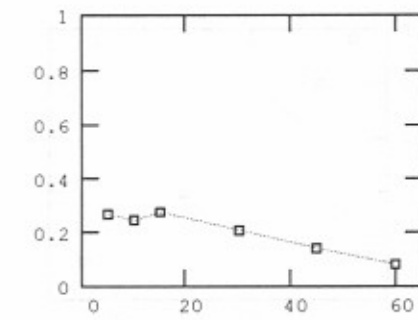
1800 UT



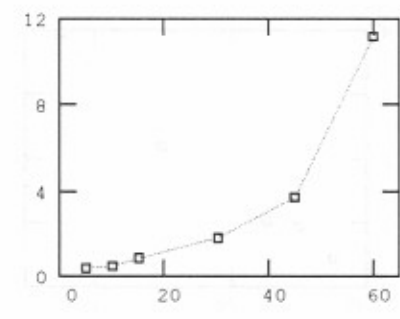
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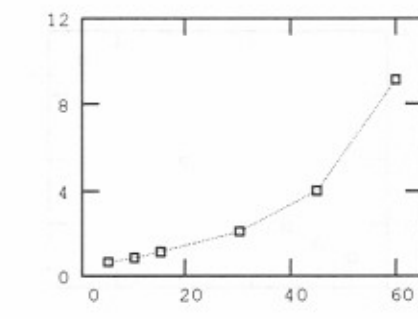
Call success rate.



Call success rate.



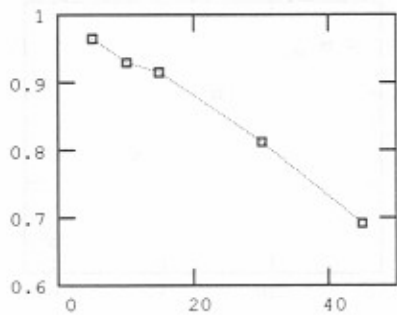
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Delays in minutes.

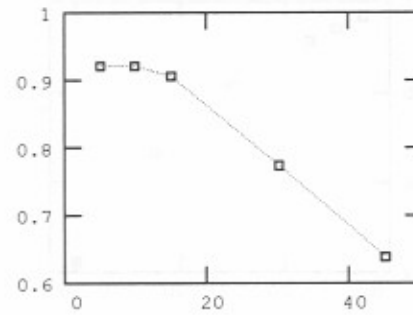
Figure D-8. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, 30, 45, and 60 messages per hour - propagation condition 3 - no sounds.

0600 UT

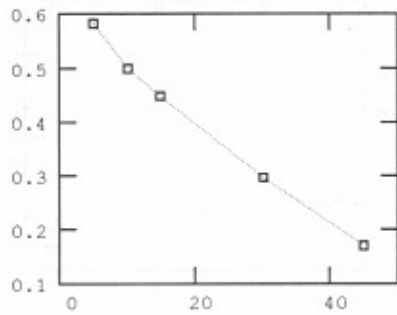


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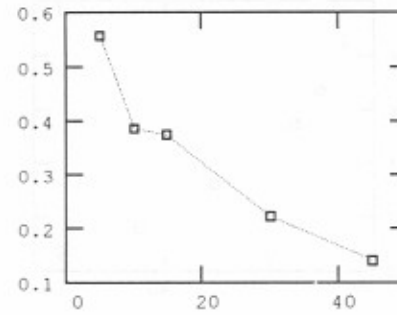
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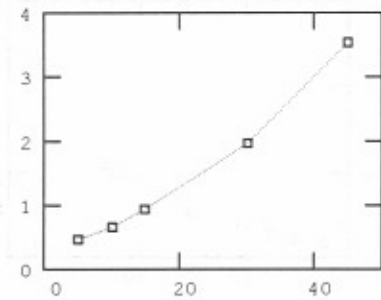
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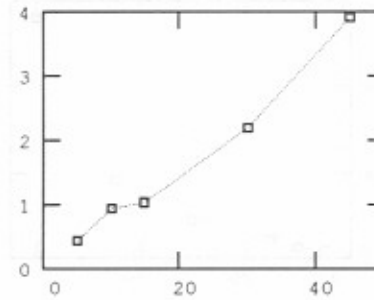
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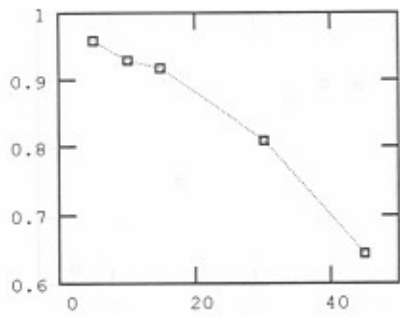
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Delays in minutes.

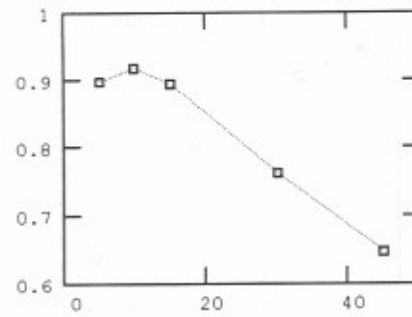
Figure D-9. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, 30, and 45 messages per hour - propagation condition 3 - sounds scheduled every 15 minutes.

0600 UT

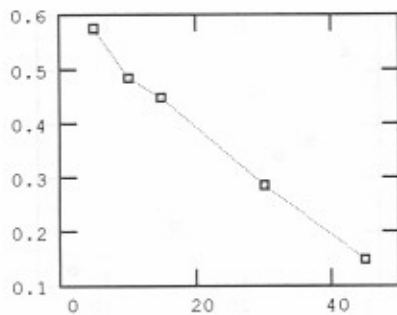


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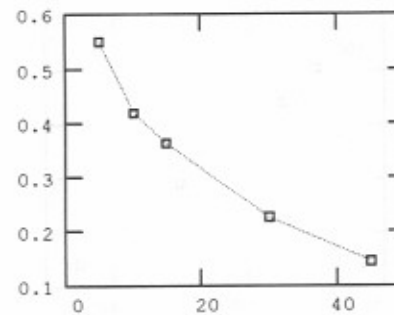
1800 UT



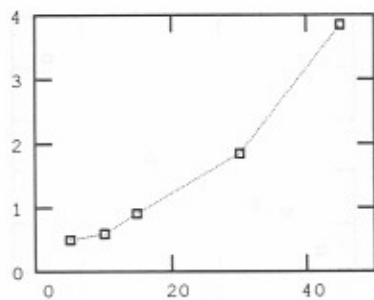
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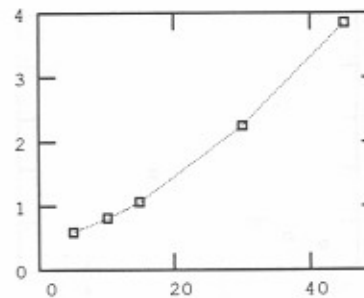
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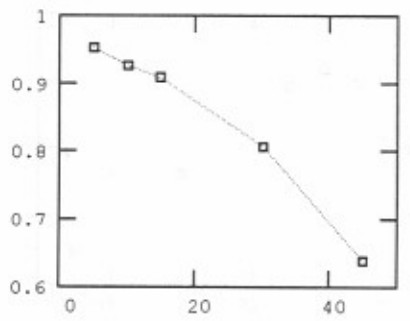
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Delays in minutes.

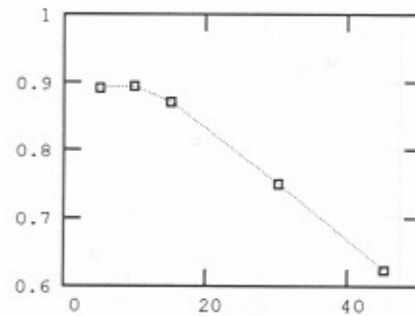
Figure D-10. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, 30, and 45 messages per hour - propagation condition 3 - sounds scheduled every 10 minutes.

0600 UT

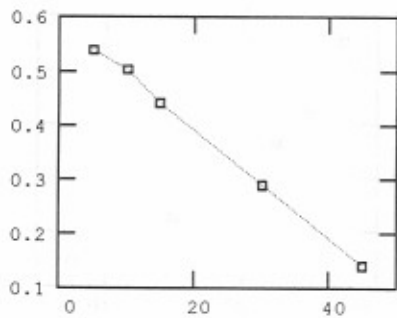


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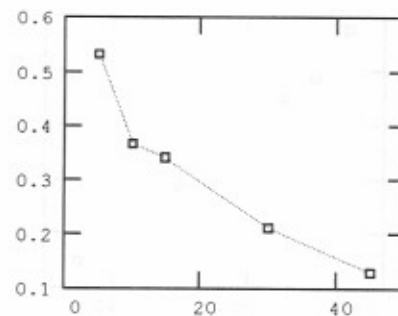
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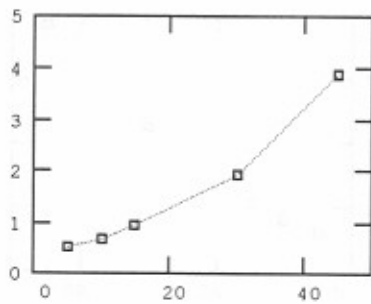
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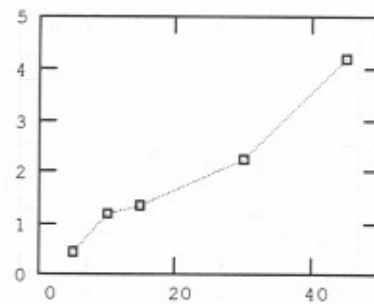
Call success rate.



Call success rate.



Delays in minutes.

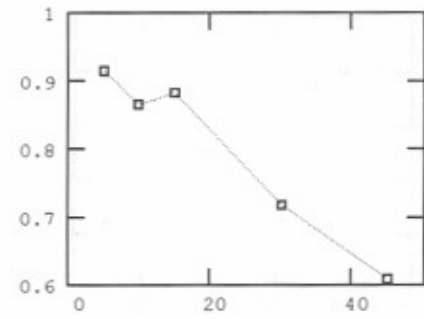
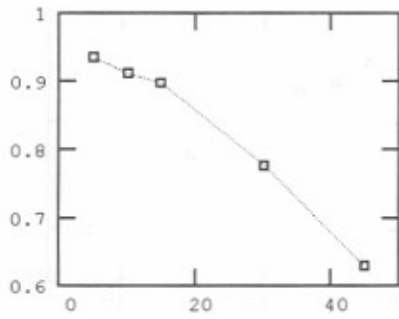


Delays in minutes.

Figure D-11. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, 30, and 45 messages per hour - propagation condition 3 - sounds scheduled every 6 minutes.

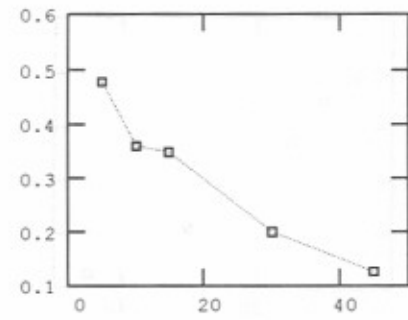
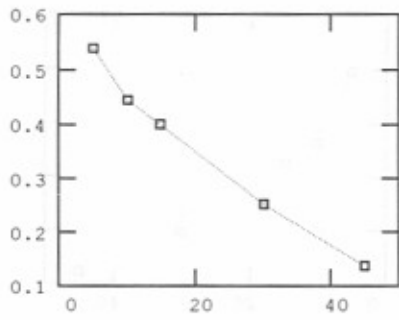
0600 UT

1800 UT



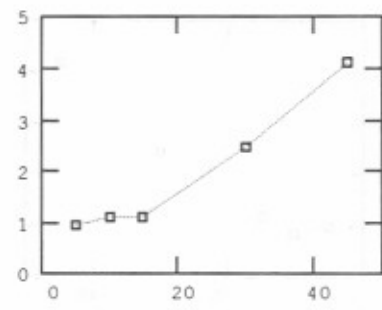
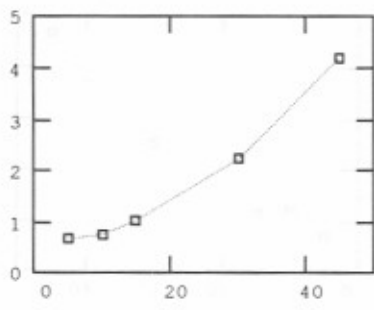
Link success rate.

Link success rate.



Call success rate.

Call success rate.

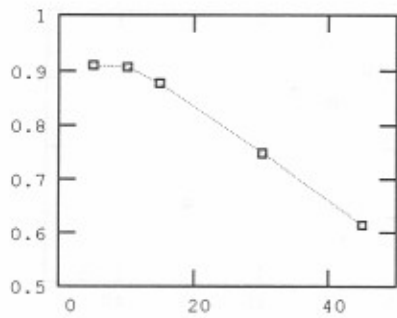


Delays in minutes.

Delays in minutes.

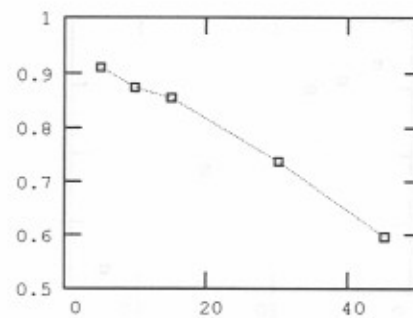
Figure D-12. Simulated network performance for 0600 and 1800 (UT) - propagation condition 3 - sounds scheduled every 3 minutes.

0600 UT

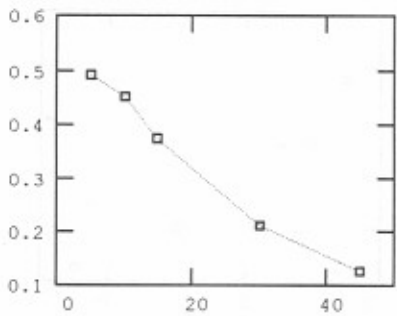


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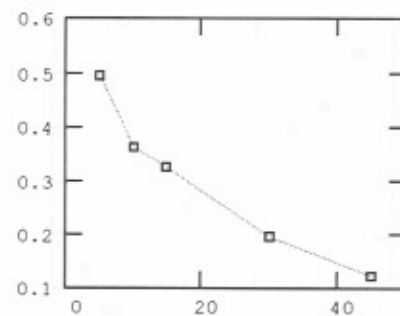
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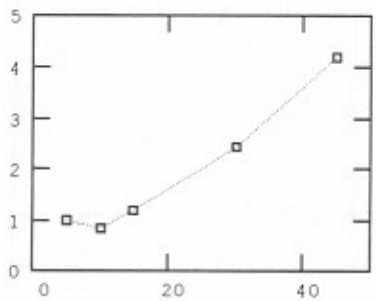
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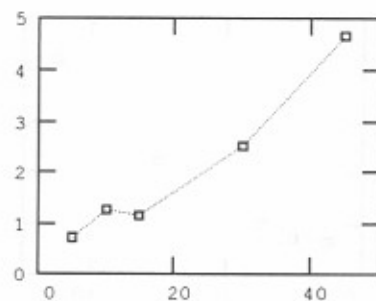
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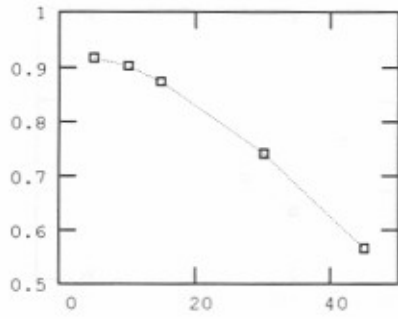
Delays in minutes.



Delays in minutes.

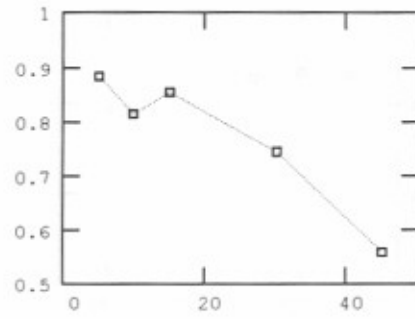
Figure D-13. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, 30, and 45 messages per hour - propagation condition 3 - sounds scheduled every 2 minutes.

0600 UT

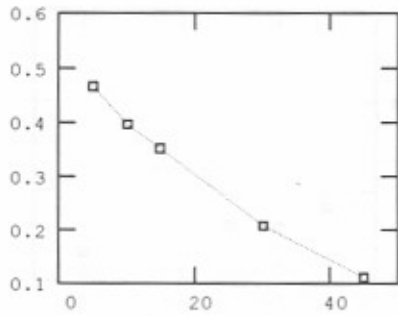


Link success rate.

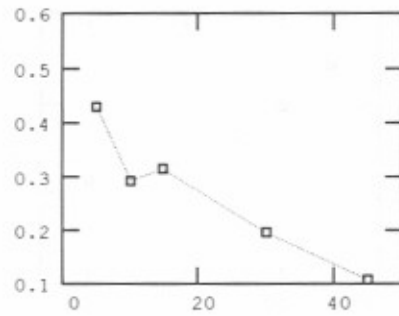
1800 UT



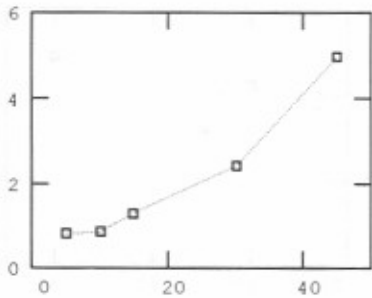
Link success rate.



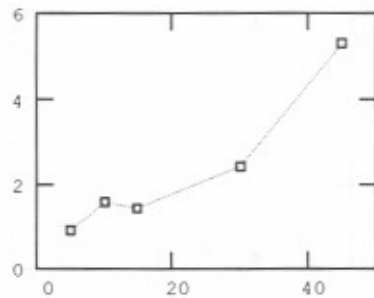
Call success rate.



Call success rate.



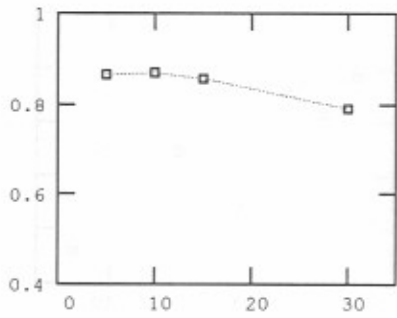
Delays in minutes.



Delays in minutes.

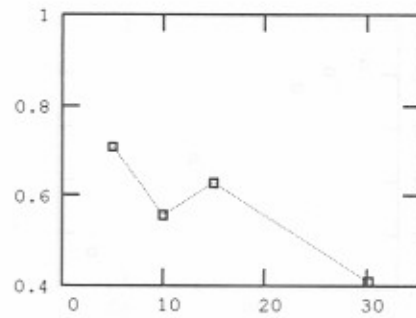
Figure D-14. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, 30, and 45 messages per hour - propagation condition 3 - sounds scheduled every minute.

0600 UT

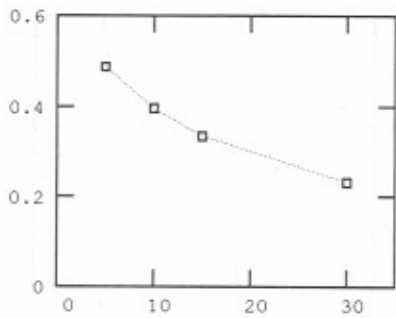


Link success rate.

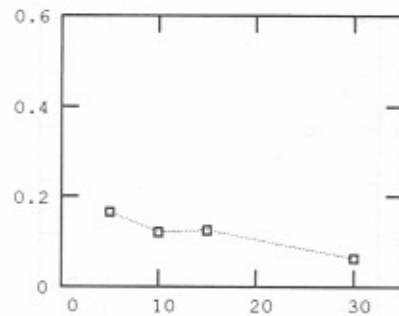
1800 UT



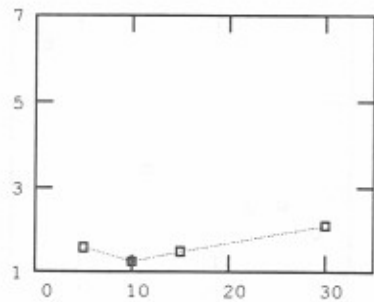
Link success rate.



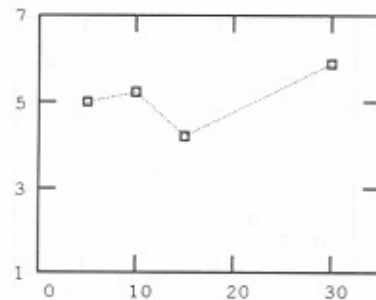
Call success rate.



Call success rate.



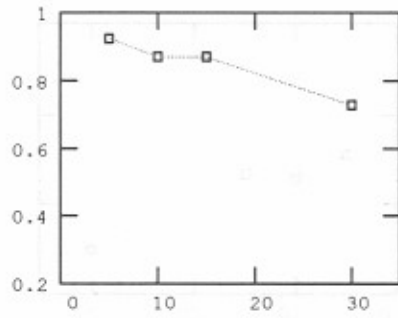
Delays in minutes.



Delays in minutes.

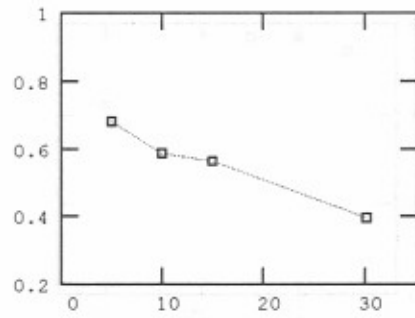
Figure D-15. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, and 30 messages per hour - propagation condition 5 - no sounds.

0600 UT

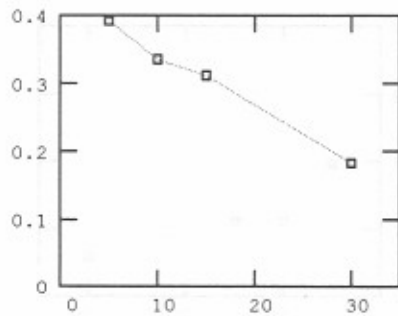


Link success rate.

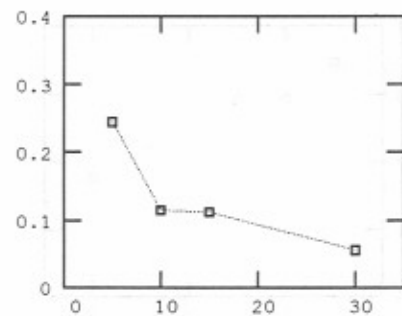
1800 UT



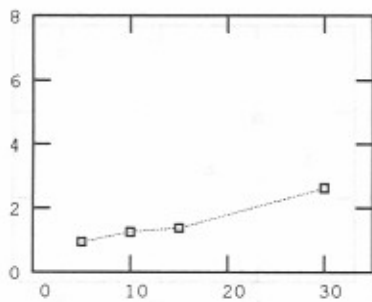
Link success rate.



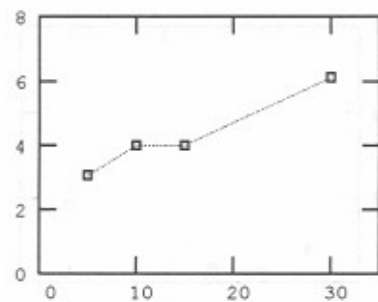
Call success rate.



Call success rate.



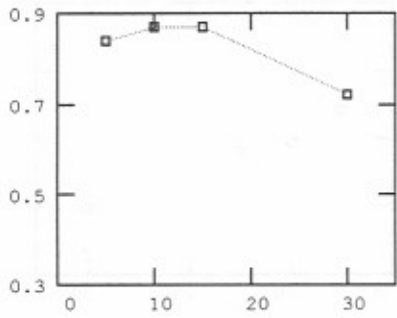
Delays in minutes.



Delays in minutes.

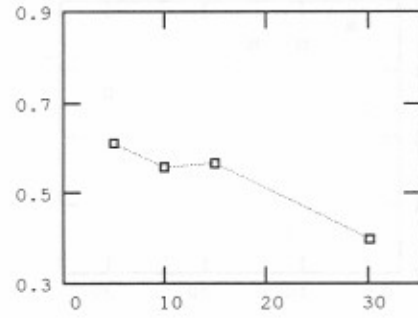
Figure D-16. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, and 30 messages per hour - propagation condition 5 - sounds scheduled every 15 minutes.

0600 UT

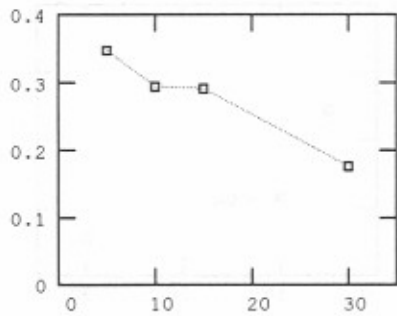


Link success rate.

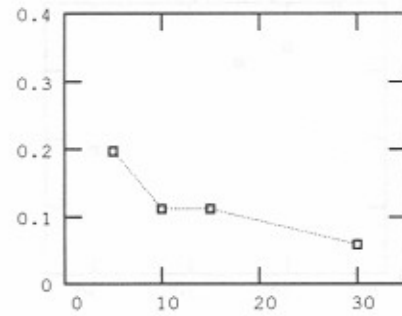
1800 UT



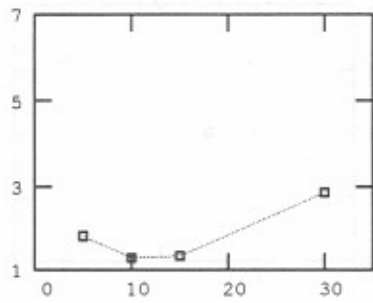
Link success rate.



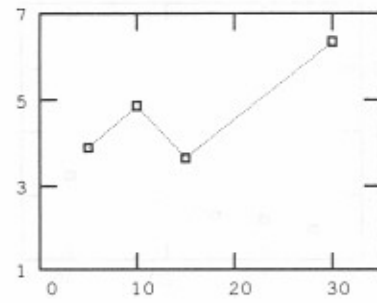
Call success rate.



Call success rate.



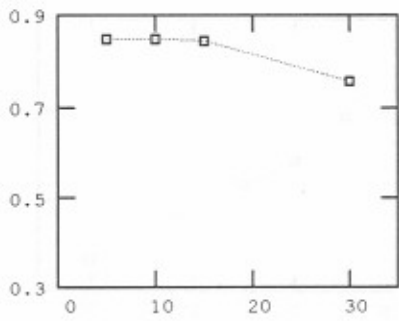
Delays in minutes.



Delays in minutes.

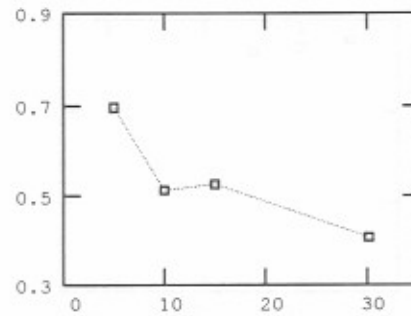
Figure D-17. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, and 30 messages per hour - propagation condition 5 - sounds scheduled every 10 minutes.

0600 UT

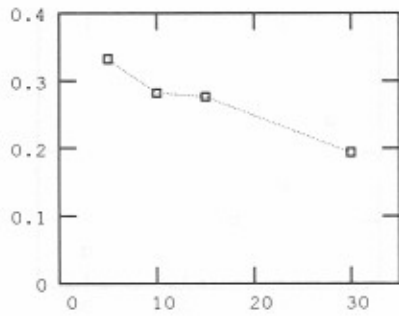


Link success rate.

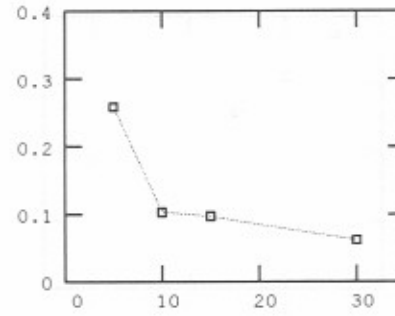
1800 UT



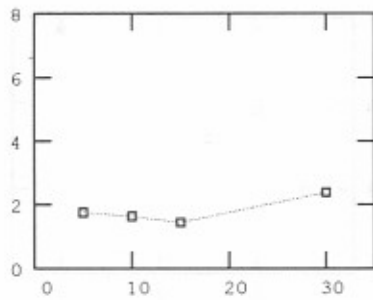
Link success rate.



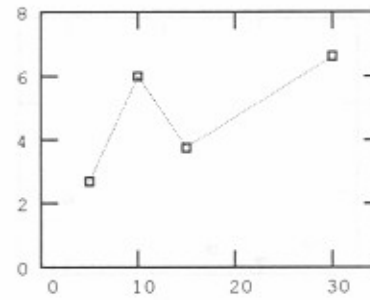
Call success rate.



Call success rate.



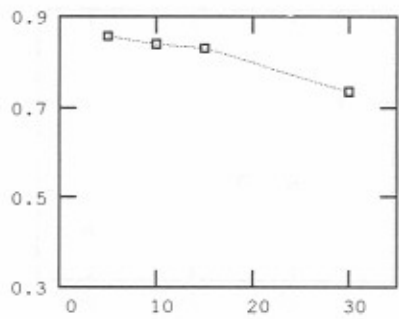
Delays in minutes.



Delays in minutes.

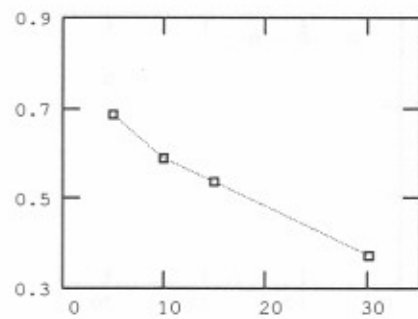
Figure D-18. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, and 30 messages per hour - propagation condition 5 - sounds scheduled every 6 minutes.

0600 UT

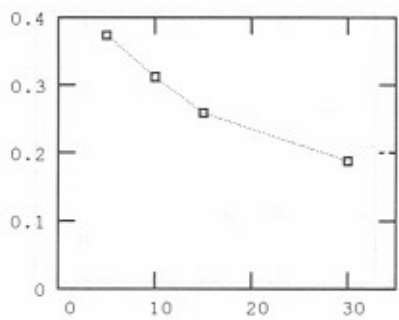


Link success rate.

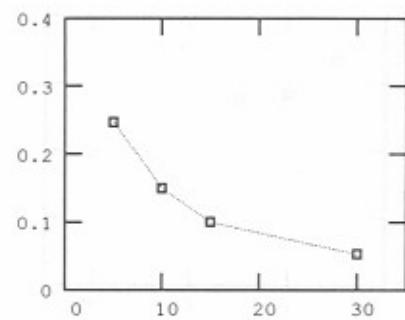
1800 UT



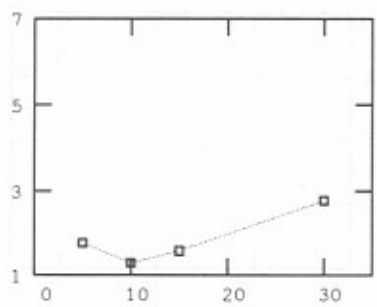
Link success rate.



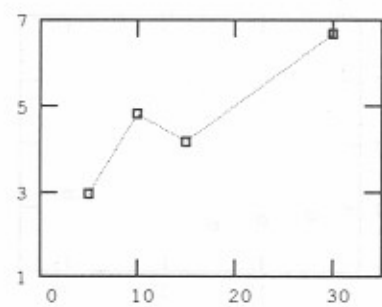
Call success rate.



Call success rate.



Delays in minutes.



Delays in minutes.

Figure D-19. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, and 30 messages per hour - propagation condition 5 - sounds scheduled every 3 minutes.

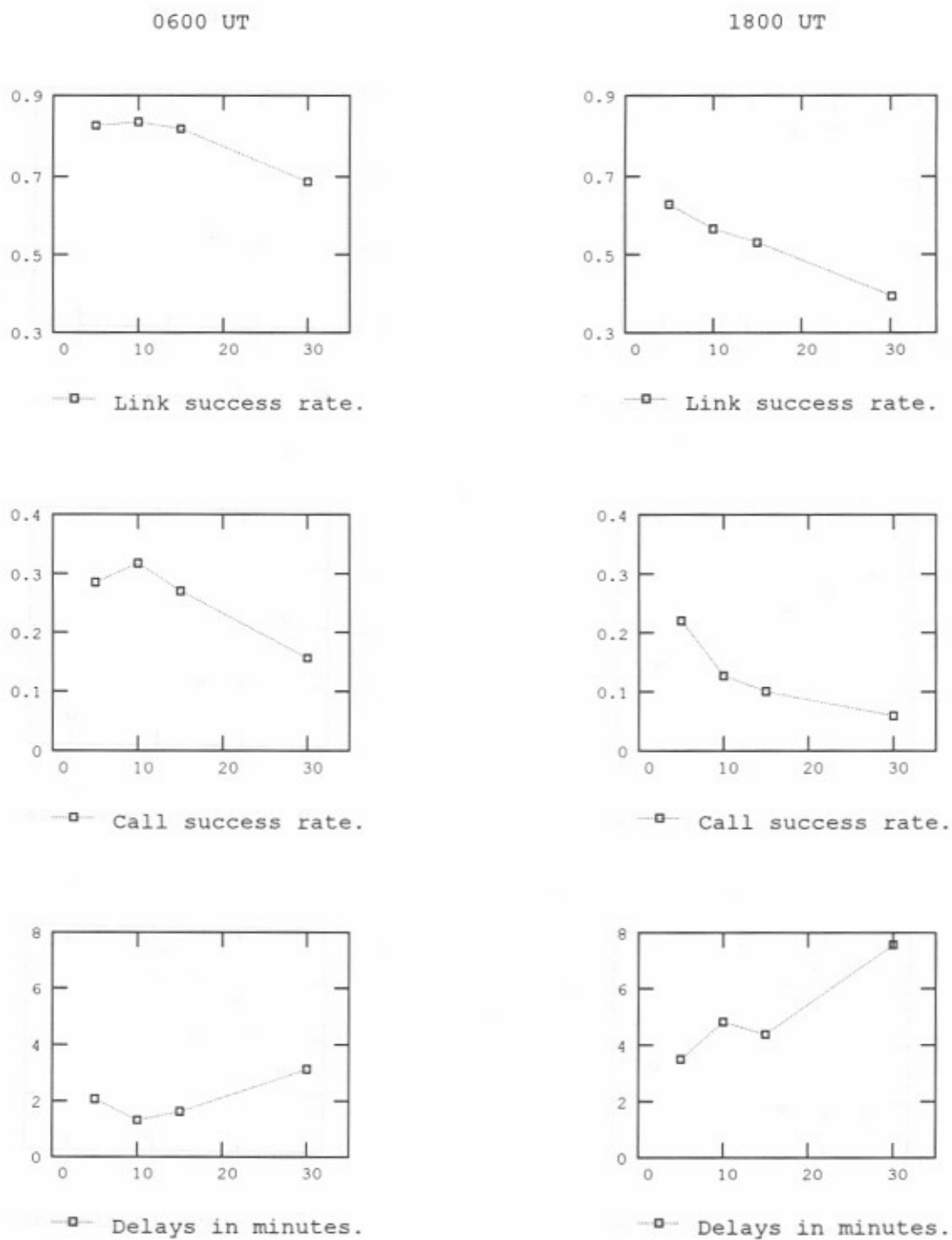
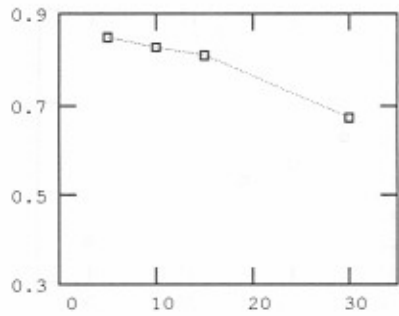


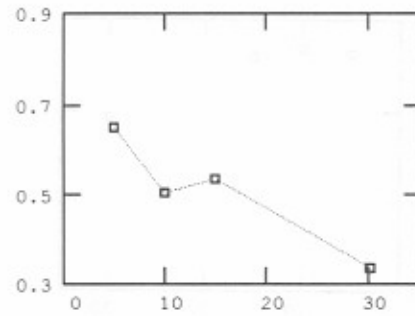
Figure D-20. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, and 30 messages per hour - propagation condition 5 - sounds scheduled every 2 minutes.

0600 UT

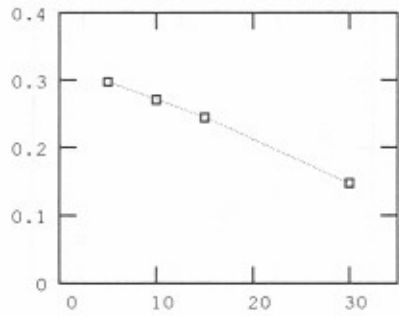


Link success rate.

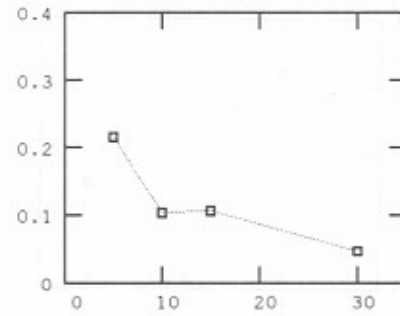
1800 UT



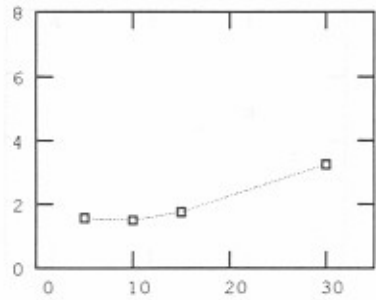
Link success rate.



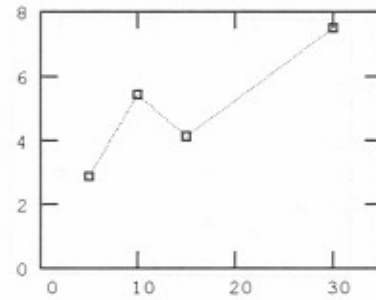
Call success rate.



Call success rate.



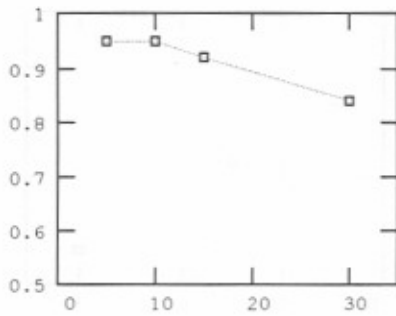
Delays in minutes.



Delays in minutes.

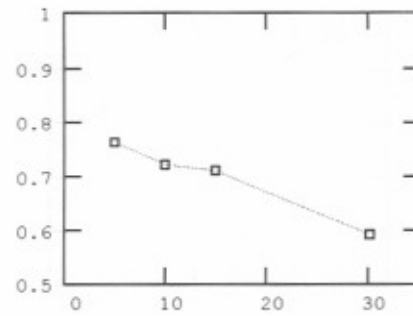
Figure D-20. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, and 30 messages per hour - propagation condition 5 - sounds scheduled every minute.

0600 UT

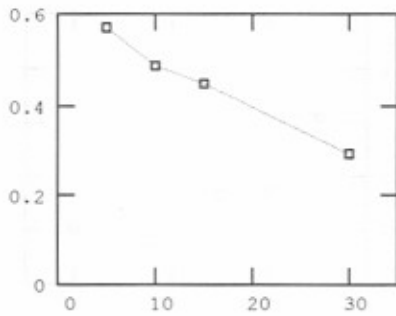


Link success rate.

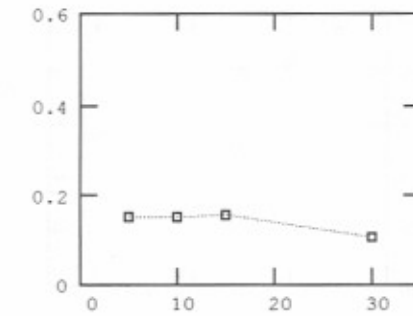
1800 UT



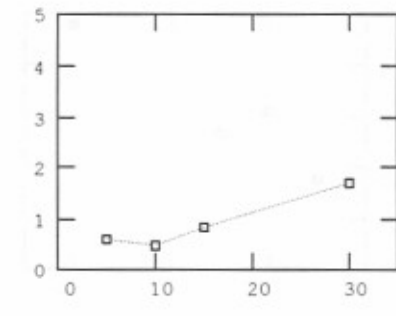
Link success rate.



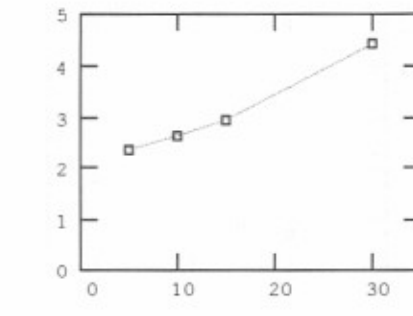
Call success rate.



Call success rate.



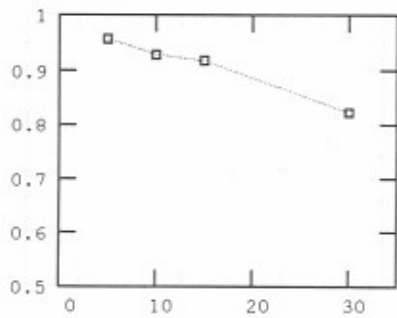
Delays in minutes.



Delays in minutes.

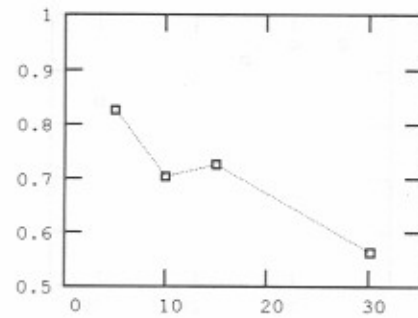
Figure D-22. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, and 30 messages per hour - propagation condition 8 - no sounds.

0600 UT

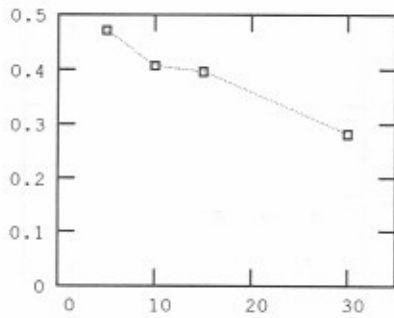


Link success rate.

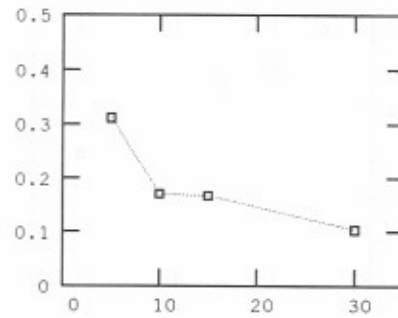
1800 UT



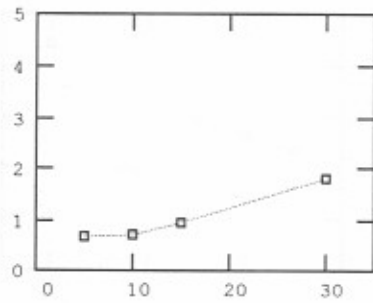
Link success rate.



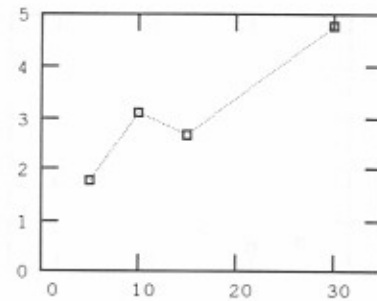
Call success rate.



Call success rate.



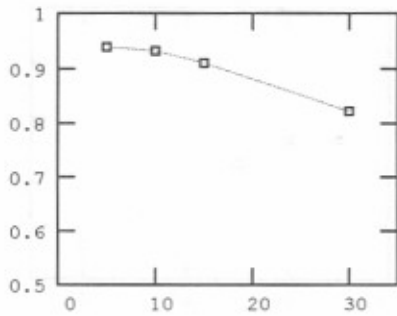
Delays in minutes.



Delays in minutes.

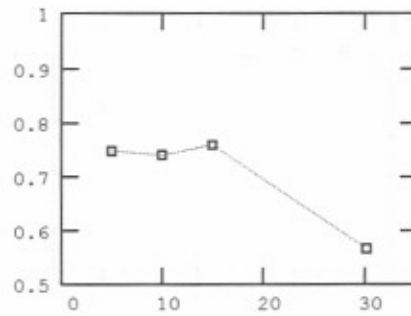
Figure D-23. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, and 30 messages per hour - propagation condition 8 - sounds scheduled every 15 minutes.

0600 UT

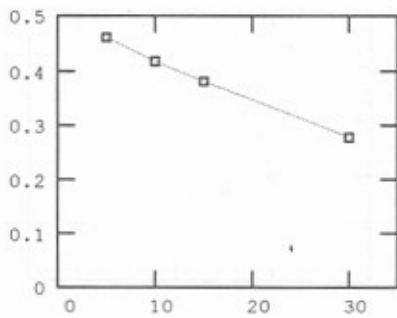


Link success rate.

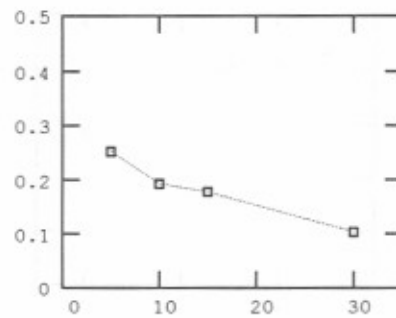
1800 UT



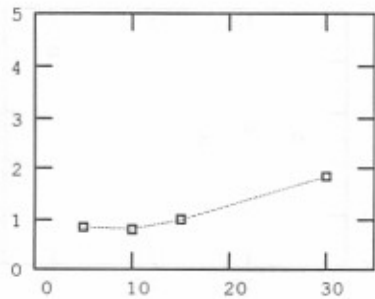
Link success rate.



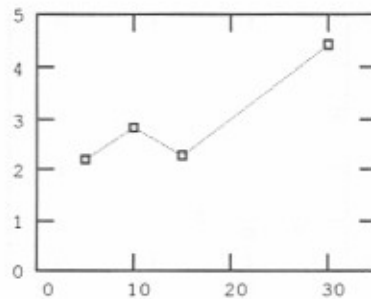
Call success rate.



Call success rate.



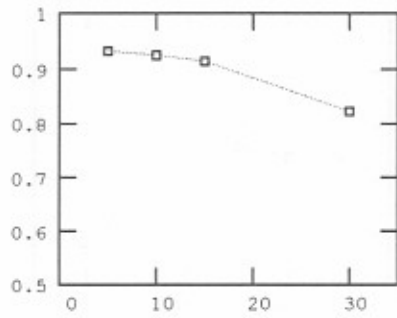
Delays in minutes.



Delays in minutes.

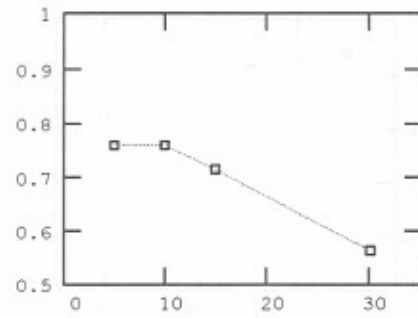
Figure D-24. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, and 30 messages per hour - propagation condition 8 - sounds scheduled every 10 minutes.

0600 UT

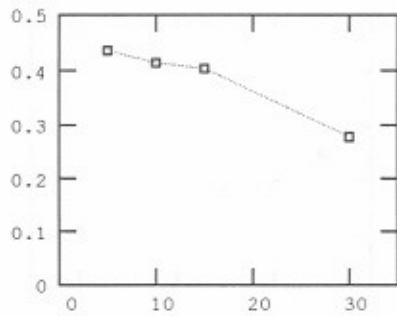


Link success rate.

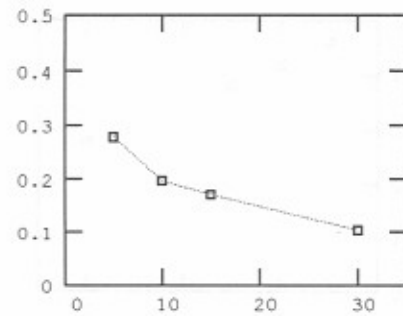
1800 UT



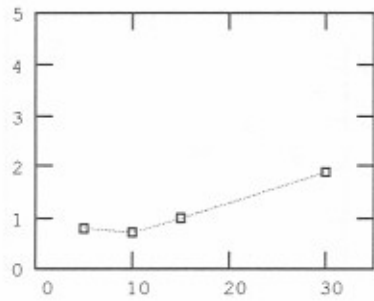
Link success rate.



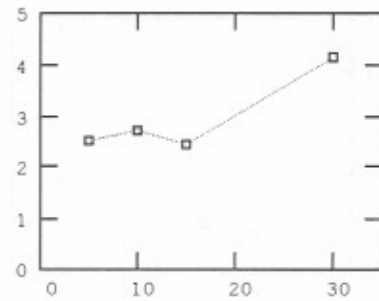
Call success rate.



Call success rate.



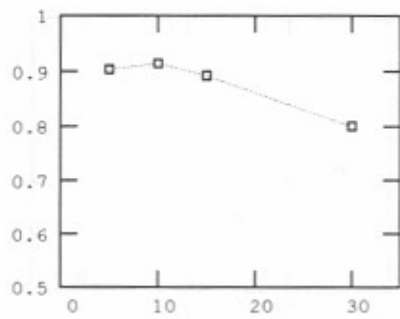
Delays in minutes.



Delays in minutes.

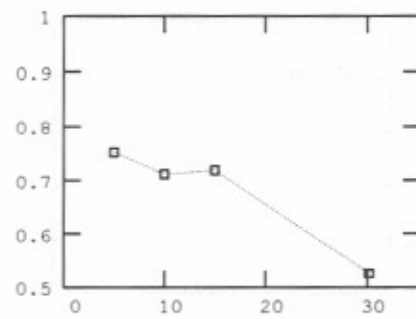
Figure D-25. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, and 30 messages per hour - propagation condition 8 - sounds scheduled every 6 minutes.

0600 UT

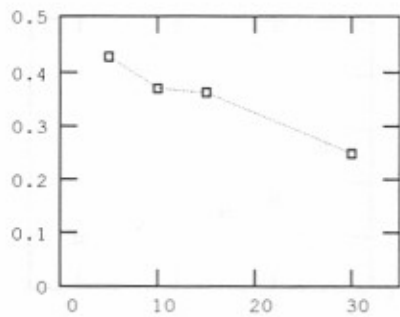


Link success rate.

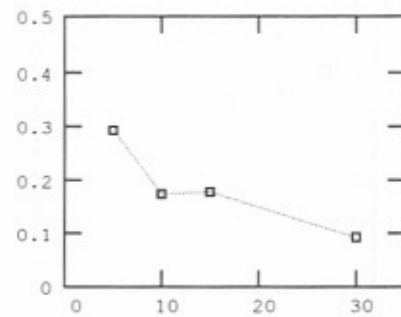
1800 UT



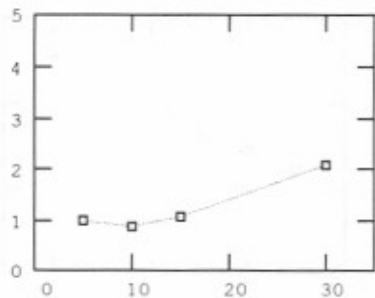
Link success rate.



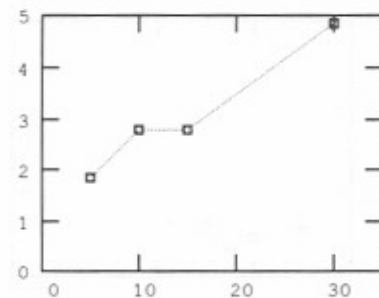
Call success rate.



Call success rate.



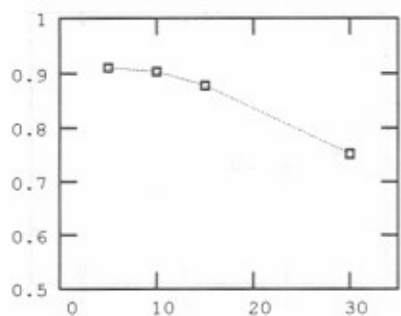
Delays in minutes.



Delays in minutes.

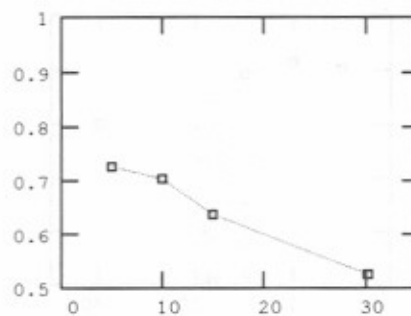
Figure D-26. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, and 30 messages per hour - propagation condition 8 - sounds scheduled every 3 minutes.

0600 UT

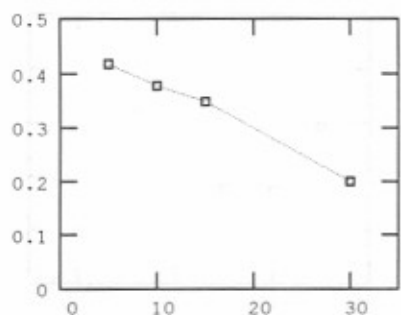


Link success rate.

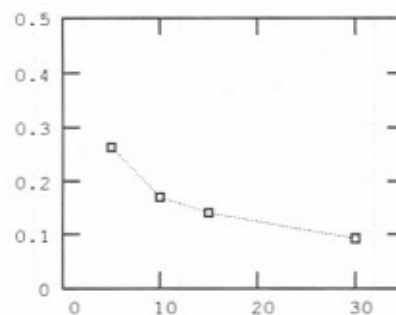
1800 UT



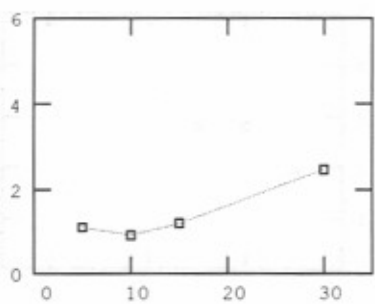
Link success rate.



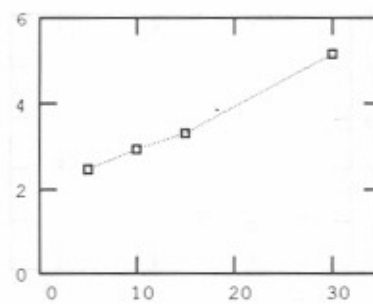
Call success rate.



Call success rate.



Delays in minutes.

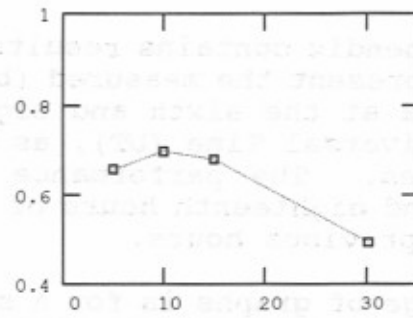
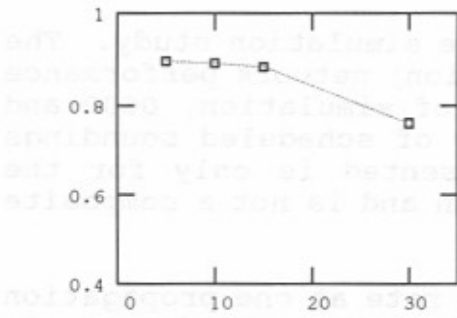


Delays in minutes.

Figure D-27. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, and 30 messages per hour - propagation condition 8 - sounds scheduled every 2 minutes.

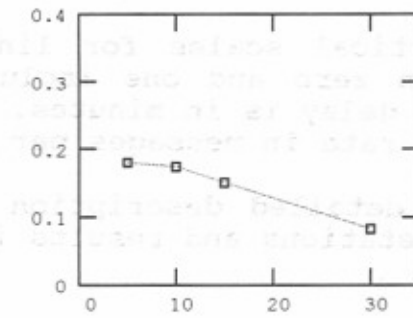
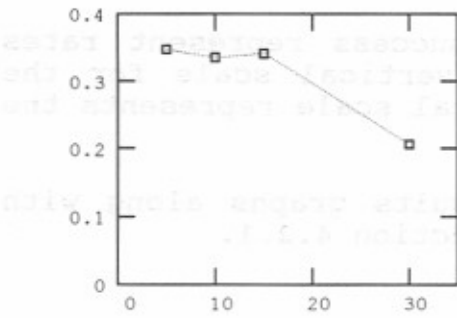
0600 UT

1800 UT



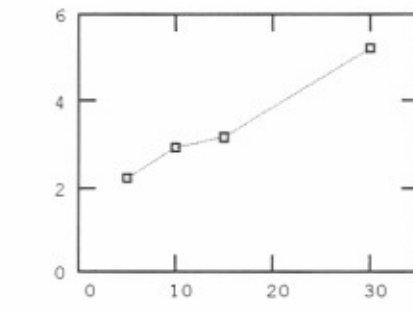
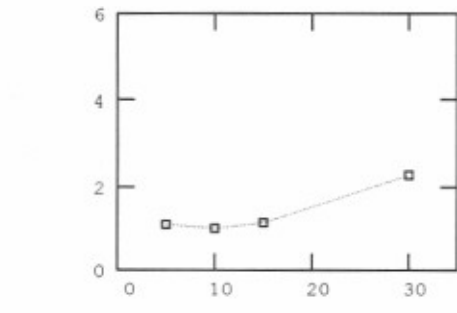
Link success rate.

Link success rate.



Call success rate.

Call success rate.



Delays in minutes.

Delays in minutes.

Figure D-28. Simulated network performance for 0600 and 1800 (UT) - 5, 10, 15, and 30 messages per hour - propagation condition 8 - sounds scheduled every minute.