Package: endtoend (via r-universe)

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Type Package

Title Transmissions and Receptions in an End to End Network

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Description Computes the expectation of the number of transmissions and receptions considering an End-to-End transport model with limited number of retransmissions per packet. It provides theoretical results and also estimated values based on Monte Carlo simulations. It is also possible to consider random data and ACK probabilities.

License GPL (>= 2)

Imports pastecs, ggplot2

Suggests hopbyhop, Opportunistic

NeedsCompilation no

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Repository https://epiverse-connect.r-universe.dev

RemoteUrl https://github.com/cran/endtoend

RemoteRef HEAD

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Contents

ETE *Theoretical transmissions/receptions for a L-limited End to End model*

Description

This function computes the expected value of the number of transmissions/receptions for End to End model with L-limited retransmissions per packet.

Usage

```
ETE(p1, p2, L, N)
```

Arguments

p1	Data success probability
p2	ACK success probability
L	Maximum number of retransmissions.
N	Number of Hops

Details

When there is no limitation, L value must be set as L=Inf.

Value

The ouput is a matrix containing the following values:

1	Success Probability
2	Expected Data Transmissions
3	Expected ACK Transmissions
4	Expected Total Transmissions
5	Expected Data Receptions
6	Expected ACK Receptions
7	Expected Total Receptions

Author(s)

Christian E. Galarza and Jonathan M. Olate

References

Heimlicher, S., Nuggehalli, P., & May, M. (2007). End-to-end vs. hop-by-hop transport. ACM SIGMETRICS Performance Evaluation Review, 35(3), 59.

Heimlicher, S., Karaliopoulos, M., Levy, H., & May, M. (2007). End-to-end vs. Hop-by-hop Transport under Intermittent Connectivity (Invited Paper). Proceedings of the First International Conference on Autonomic Computing and Communication Systems.

See Also

MCETE,stochastic_ETE

Examples

```
#An N=5 End to End system with limited L=7 retransmission per hop
ETE(p1=0.65,p2=0.4,L=7,N=5)

#An unlimited N=5 End to End system
ETE(p1=0.65,p2=0.4,L=Inf,N=5)
```

MCETE *Monte Carlo transmissions/receptions simulations for a L-limited End to End model*

Description

This function compute the mean of the number of transmissions/receptions for End to End model with L-limited retransmissions per packet simulating via Monte Carlo.

Usage

```
MCETE(p1, p2, L, N, M = 5000)
```

Arguments

p1	Data success probability
p2	ACK success probability
L	Maximum number of retransmissions
N	Number of Hops
M	Number of Monte Carlo Simulations

Value

The ouput is a matrix containing the following values:

1	MC Success Probability
2	MC Mean Data Transmissions
3	MC Mean ACK Transmissions
4	MC Mean Total Transmissions
5	MC Mean Data Receptions
6	MC Mean ACK Receptions
7	MC Mean Total Receptions

Author(s)

Christian E. Galarza and Jonathan M. Olate

References

Heimlicher, S., Nuggehalli, P., & May, M. (2007). End-to-end vs. hop-by-hop transport. ACM SIGMETRICS Performance Evaluation Review, 35(3), 59.

Heimlicher, S., Karaliopoulos, M., Levy, H., & May, M. (2007). End-to-end vs. Hop-by-hop Transport under Intermittent Connectivity (Invited Paper). Proceedings of the First International Conference on Autonomic Computing and Communication Systems.

See Also

ETE,stochastic_ETE

Examples

```
#Monte Carlo simulations for an N=5 End to End system
#with limited L=7 retransmission per hop

MCETE(p1=0.65,p2=0.4,L=7,N=5)
```

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stochastic_ETE *Random Probabilities Monte Carlo transmissions/receptions simulations for a L-limited End to End model*

Description

This function compute the mean of the number of transmissions/receptions for End to End model with L-limited retransmissions per packet simulating via Monte Carlo.

Usage

```
stochastic_ETE(dist1,p11,p12,dist2,p21,p22,L,N,M=10^5,printout=TRUE,plotspdf=TRUE)
```

Arguments

dist1	For the data success probability: probability density function. Options are "uniform" and "beta".
p11	For the data success probability: lower limit of the uniform distribution (dist1 == "uniform") or shape1 (alpha) paremeter of a Beta distribution (dist1 == "beta").
p12	For the data success probability: upper limit of the uniform distribution (dist1 == "uniform") or shape2 (beta) paremeter of a Beta distribution (dist1 == "beta").
dist2	For the ACK success probability: probability density function. Options are "uniform" and "beta".

p21	For the ACK success probability: lower limit of the uniform distribution (dist1 == "uniform") or shape1 (alpha) paremeter of a Beta distribution (dist1 == "beta").
p22	For the ACK success probability: upper limit of the uniform distribution (dist1 == "uniform") or shape2 (beta) paremeter of a Beta distribution (dist1 == "beta").
L	Maximum number of retransmissions
N	Number of Hops
M	Number of Monte Carlo Simulations
printout	If TRUE (by default), the function prints some outputs and plots
plotspdf	If TRUE (by default), the function exports all plots in pdf in the working directory

Value

The ouput is a matrix containing two elements:

data	a dataframe containing all Monte Carlo replications
stats	descriptive statistics

for

1	p1
2	p2
1	Success Probability
2	Expected Data Transmissions
3	Expected ACK Transmissions
4	Expected Total Transmissions
5	Expected Data Receptions
6	Expected ACK Receptions
7	Expected Total Receptions

Author(s)

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References

Heimlicher, S., Nuggehalli, P., & May, M. (2007). End-to-end vs. hop-by-hop transport. ACM SIGMETRICS Performance Evaluation Review, 35(3), 59.

Heimlicher, S., Karaliopoulos, M., Levy, H., & May, M. (2007). End-to-end vs. Hop-by-hop Transport under Intermittent Connectivity (Invited Paper). Proceedings of the First International Conference on Autonomic Computing and Communication Systems.

See Also

ETE,MCETE

Examples

```
#Monte Carlo simulations for an N=5 End to End system
#with limited L=7 retransmission per hop

#We now consider p1 ~ Uniform(0.2,0.6)
dist1 = "uniform"
p11 = 0.2
p12 = 0.6

#and p2 ~ Beta(3,1)
dist2 = "beta"
p21 = 3
p22 = 1

#no outputs and plots
out = stochastic_ETE(dist1,p11,p12,dist2,p21,p22,L=7,N=5,M=5*10^3,printout=FALSE,plotspdf=FALSE)
out$data  #simulations
out$stats #resume

#uncommnet next line for outputs plots and pdf file
#out = stochastic_ETE(dist1,p11,p12,dist2,p21,p22,L=7,N=5,M=5*10^3)
```

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