experiment- 7

exam arshad

roll no. 1829126

aim: study the effect of handover (mobility management) threshold and margin on sinr and call drop probability and handover probability using virtual lab.

platform: virtual lab> iit kharagpur

objective>: to study the effect of handover threshold and margin on sinr and call drop probability and handover probability

prerequisite>:
handoff in cellular communication>, the handoff is the proce>> by which an active call is tran>ferred from one cell to another. when a mobile >tation is in motion and is moving away from the ba>e tran>ceiver >tation, into another cell which is covered by another ba>e >tation, the call is required to be tran>ferred. the proce>> is called handoff.
>ituation> triggering handoff type> of handoff
mobile a>>i>ted handoff

procedure:

- launch the java application for experiment 7 and click on the >tart button.
- enter your name and click ok button.
- >elect the variou> parameter> >uch a> environment, frequency reu>e ratio, carrier frequency and margin> for handoff. you could al>o >et the velocity of the mobile >tation.
- click on >et button to apply the variou> parameter>.
- now click on >tart button to >tart the experiment.

• observe the number of call drops and number of handoffs.
• change the parameters, such as increase the amount of noise, decrease the transmit power of base station, or change the environment and observe the difference in number of call drops and handoffs.
• enter the observations in the provided box and click on submit to generate report.

observations:
• how does signal to noise ratio at the receiver affect the number of handoffs and call drops?
• what are the changes in percentage of outage on changing the handoff margins?
• collect the following tabulations and record your observations.
• set mobile speed to 50 mps and vary the reuse ratio to 1 and 3 and record the number of handoffs, outage duration and outage percentage. what can be observed from the table?
reuse no of handoffs

reuse	mobile speed	no of handoffs	outage	outage percentage
1	5.0	50mps	12384	61.87%
3	7.0	50mps	0	0

• keep reuse ratio 3 and set mobile speed to 50 mps and 100 mps and record the below data. what do we observe after increasing the speed of the mobile station?
reuse mobile speed no of handoffs outage outage percentage

reuse	mobile speed	no of handoffs	outage	outage percentage
3	9.0	50mps	1008	5.04%
3	54.0	100mps	504	2.52%

- keep the other parameters same and increase radius of the cell from 50m to 200m. record your observations from the tabulated data.
reuse mobile speed cell radius no of handoffs

reuse	cell radius	mobile speed	no of handoffs
3	50.0	50mps	10.0
3	100.0	50mps	1.0
3	200.0	50mps	0.0

- similarly, observe the effects of other parameters on number of handoffs and outage duration.

Fading Channels &Mobile Communications

IIT Kharagpur

Date: Feb/15/2021

Exp 8: Handoff

Name:Divyansh Srivastav

Input Parameters	
Reuse: 3 ,Model: Rune	Pt(dBm): 34
fc(GHz): 0.9	Beam Width(deg): 70
Rotate(deg): 30	Cell Radius(m): 50
hT(m): 10	hM(m): 1
Sigma(dB): 4	Vertical Tilt(deg): 12
SNR(dB): 5	Band Width(MHz): 5
Noise Figure(dB): 7	Noise Power(dBm): -100.01
Pr0(dBm): -95.01	Time Slot(s): 20

Exp. Results

SNR	No.Calldrops	No.Handoffs	Delta1	Delta2	Reading Time(ms)	Outage Time(ms)	% Outage	Alpha
5.0	4.0	5.0	3.0	3.0	20016.0	12384.0	61.87	0.1
5.0	0.0	7.0	3.0	3.0	20016.0	0.0	0.0	0.1

Observation
Observation not entered

(Signature of:Divyansh Srivastav)

(Signature of faculty)

Fading Channels &Mobile Communications

IIT Kharagpur

Date: Feb/15/2021

Exp 8: Handoff

Name:Divyansh Srivastav

Input Parameters	
Reuse: 1 ,Model: Rune	Pt(dBm): 34
fc(GHz): 0.9	Beam Width(deg): 70
Rotate(deg): 30	Cell Radius(m): 200
hT(m): 10	hM(m): 1
Sigma(dB): 4	Vertical Tilt(deg): 12
SNR(dB): 5	Band Width(MHz): 5
Noise Figure(dB): 7	Noise Power(dBm): -100.01
Pr0(dBm): -95.01	Time Slot(s): 20

Exp. Results

SNR	No.Calldrops	No.Handoffs	Delta1	Delta2	Reading Time(ms)	Outage Time(ms)	% Outage	Alpha
5.0	6.0	6.0	3.0	3.0	20016.0	11376.0	56.83	0.1
5.0	1.0	0.0	3.0	3.0	20625.0	16875.0	81.82	0.1
5.0	1.0	1.0	3.0	3.0	22500.0	7500.0	33.33	0.1

Observation

mobility managemnet (hand-off, hand-over) based on varting cell radius with (50m, 100m, 200m), with reuse ratio 1

(Signature of:Divyansh Srivastav)

(Signature of faculty)

Fading Channels &Mobile Communications

IIT Kharagpur

Date: Feb/15/2021

Exp 8: Handoff

Name:Divyansh Srivastav

Input Parameters	
Reuse: 1 ,Model: Rune	Pt(dBm): 34
fc(GHz): 0.8	Beam Width(deg): 70
Rotate(deg): 30	Cell Radius(m): 200
hT(m): 10	hM(m): 1
Sigma(dB): 4	Vertical Tilt(deg): 12
SNR(dB): 5	Band Width(MHz): 5
Noise Figure(dB): 7	Noise Power(dBm): -100.01
Pr0(dBm): -95.01	Time Slot(s): 20

Exp. Results

SNR	No.Calldrops	No.Handoffs	Delta1	Delta2	Reading Time(ms)	Outage Time(ms)	% Outage	Alpha
5.0	6.0	6.0	3.0	3.0	20016.0	11376.0	56.83	0.1
5.0	1.0	0.0	3.0	3.0	20625.0	16875.0	81.82	0.1
5.0	1.0	1.0	3.0	3.0	22500.0	7500.0	33.33	0.1

Observation
Observation not entered

(Signature of:Divyansh Srivastav)

(Signature of faculty)

Fading Channels &Mobile Communications

IIT Kharagpur

Date: Feb/15/2021

Exp 8: Handoff

Name:Divyansh Srivastav

Input Parameters	
Reuse: 1 ,Model: Rune	Pt(dBm): 34
fc(GHz): 0.9	Beam Width(deg): 70
Rotate(deg): 30	Cell Radius(m): 200
hT(m): 10	hM(m): 1
Sigma(dB): 4	Vertical Tilt(deg): 12
SNR(dB): 5	Band Width(MHz): 5
Noise Figure(dB): 7	Noise Power(dBm): -100.01
Pr0(dBm): -95.01	Time Slot(s): 20

Exp. Results

SNR	No.Calldrops	No.Handoffs	Delta1	Delta2	Reading Time(ms)	Outage Time(ms)	% Outage	Alpha
5.0	6.0	6.0	3.0	3.0	20016.0	11376.0	56.83	0.1
5.0	1.0	0.0	3.0	3.0	20625.0	16875.0	81.82	0.1
5.0	1.0	1.0	3.0	3.0	22500.0	7500.0	33.33	0.1

Observation

mobility managemnet (hand-off, hand-over) based on varting cell radius with (50m, 100m, 200m), with reuse ratio 1

(Signature of:Divyansh Srivastav)

(Signature of faculty)

conclusion : after the successful of the mobility management we were able to determine the effect of threshold and margin on sinr and call drop probability