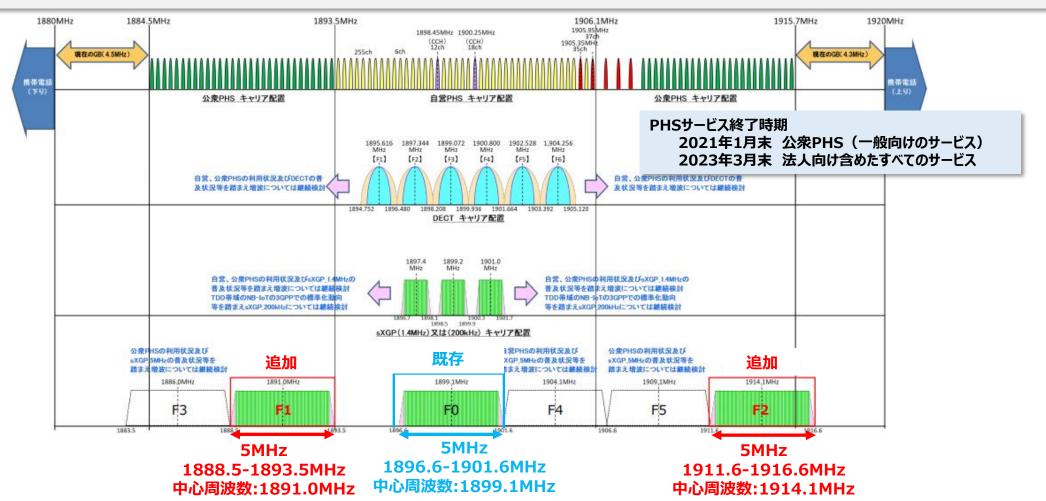
# NextEPCを用いた sXGP環境構築と実機検証

Sei Kim

#### sXGPとは

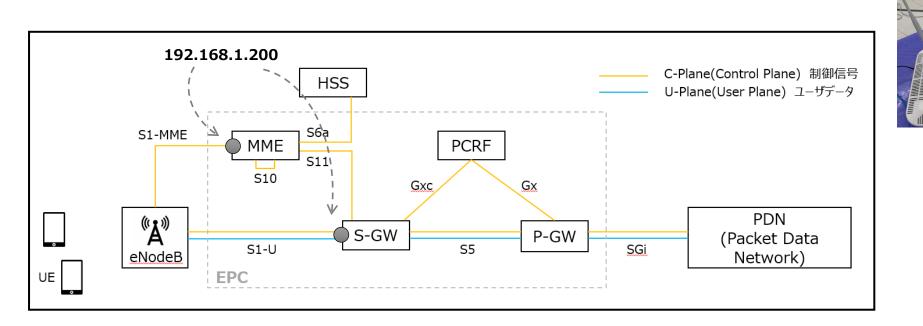
- sXGPとは、1.9GHz帯でのLTE方式を利用した自営無線規格であり、PHSおよびDECTのチャネル保護のため、キャリアセンス機能を具備している。(最大理論値は**上り:4Mbps、下り:12Mbps**)
- また、免許不要のため導入しやすく、SIM認証を採用しておりセキュアなネットワーク構築が可能、システム一式の持ち運びが容易、 といった特徴がある。
- sXGPの周波数として、既存のFOに加え、F1とF2が追加されている

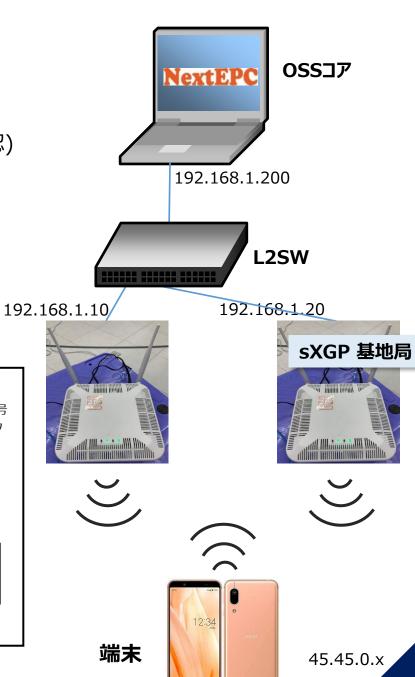


### 準備

#### 使用する物

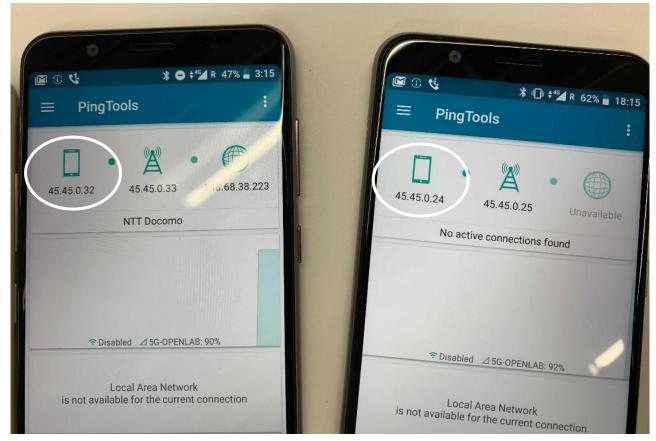
- ⇒ sXGP基地局、sXGP対応端末、sim、PC(コアインストール&基地局のWebGUI確認)
- ①VirtualBoxをインストールする。
- ②<a href="https://nextepc.org/">https://nextepc.org/</a> に従い、仮想マシン(OS:Ubuntu)上に NextEPCをパッケージインストールする。
- ③MMEとSGWのIPアドレスを書き換える。
- ④sXGP基地局とNextEPCを接続し、電波をふけることを確認する。

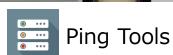




### 準備

- ⑤端末にsimを差し込み、APN設定を入れ、アタッチさせる。
- ⑥端末にIPアドレスがふられていることを確認する。









### 端末情報

	AQUOS sense3 SH-M12
外観	12:34 AQUOS
Dimensions	147mm ×70mm×8.9mm
OS	Android™ 9 Pie
対応WiFi	IEEE802.11a/b/g/n/ac
対応Band	FDD-LTE: B1/B3/B5/B8/B12/B17/B18/B19 TD-LTE: B39/B41
チップセット	Snapdragon630(2.2GHz、4コア+1.8GHz、4コア)

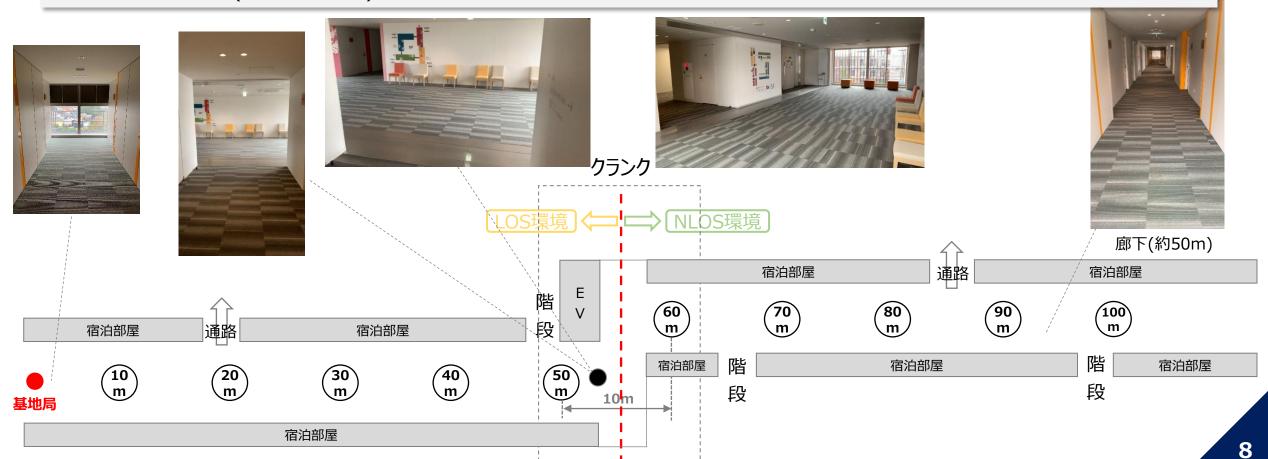
### 検証項目

項番	項目	検証内容
1	電波伝搬特性	受信電波強度とスループット、および電波伝搬距離を測定し、sXGPの電波伝搬特性を確認する。
2	複数端末 同時通信	同時に複数台の端末で通信した際の通信品質を測定する。

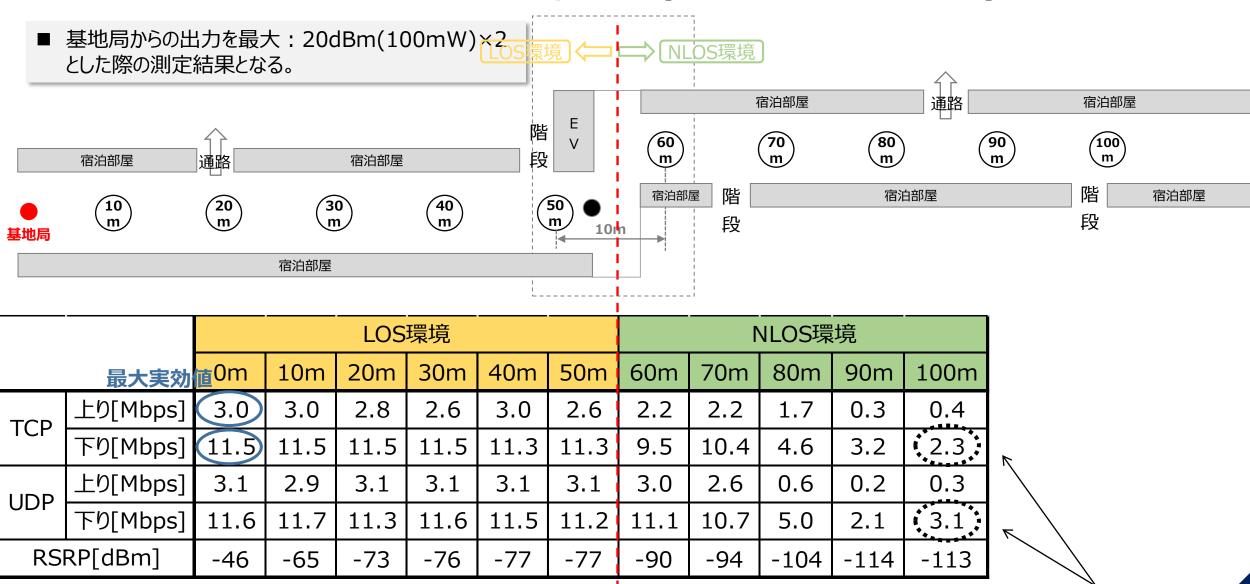
## 検証1 電波伝搬特性

### 検証1-1 電波伝搬特性

- 測定環境として、中間地点にクランクを挟んだ、約100mの廊下を使用している。
- 基地局からの距離が、10m、20m、・・・、100mである各10地点において、受信電波強度とスループット(プロトコルはTCP、UDP)を 測定している。
- 測定ツールとして、受信電波強度はNetwork Cell Infoアプリを、スループットはmagic iperfアプリ(iperf2)を使用し、上り/下りともに 30Mbpsのトラヒックを1分間印加し、平均値を算出している。
- APの周波数はF0(既存の周波数)とし、送信出力は最大と最小に設定した場合で測定している。

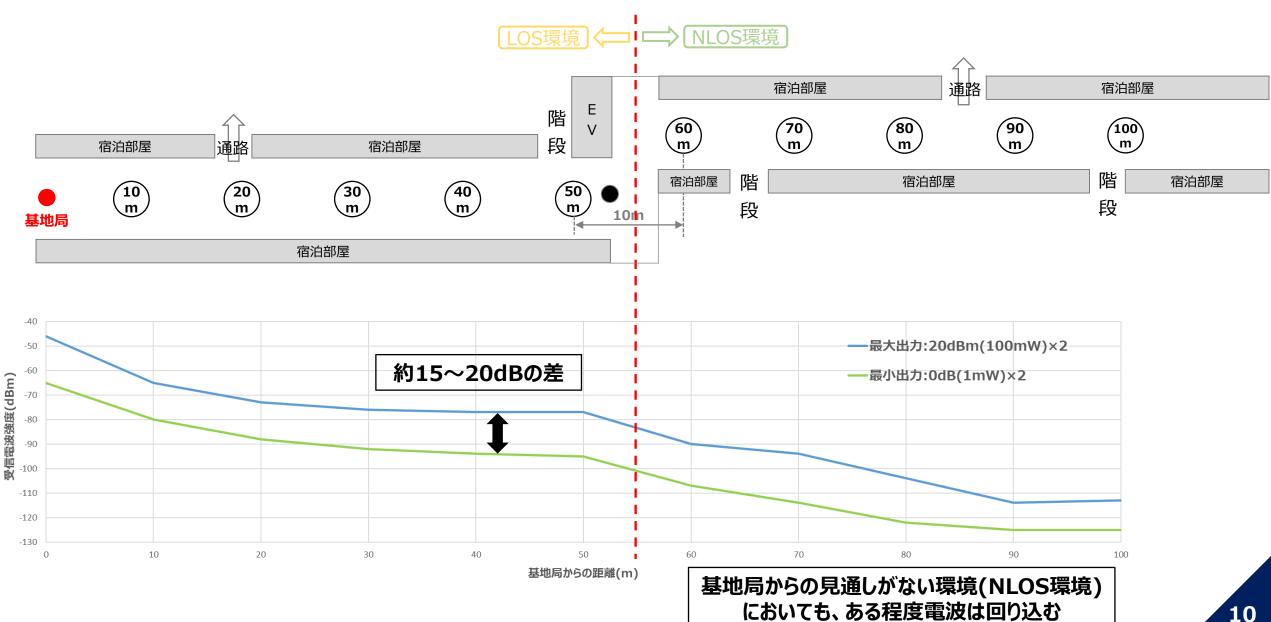


### 検証 1-1 電波伝搬特性 検証結果 (RSRP、スループット)

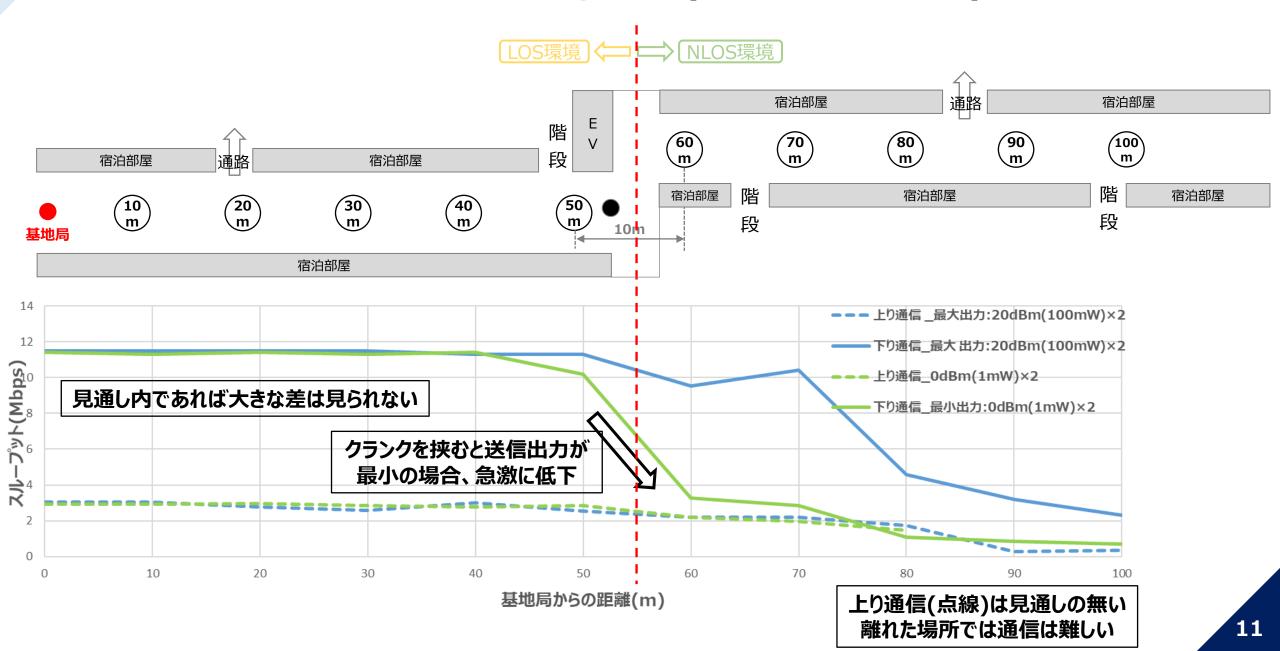


見通しがない、約100m地点 においても、下り通信は可能

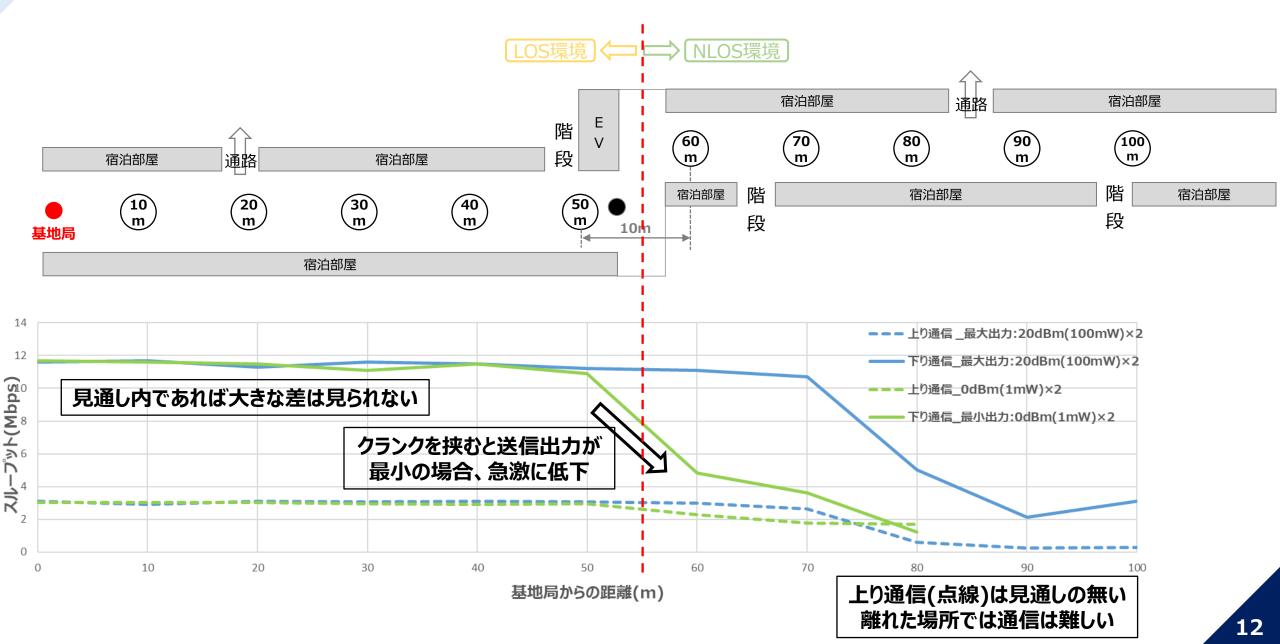
### 検証 1-1 電波伝搬特性 検証結果 (RSRP)



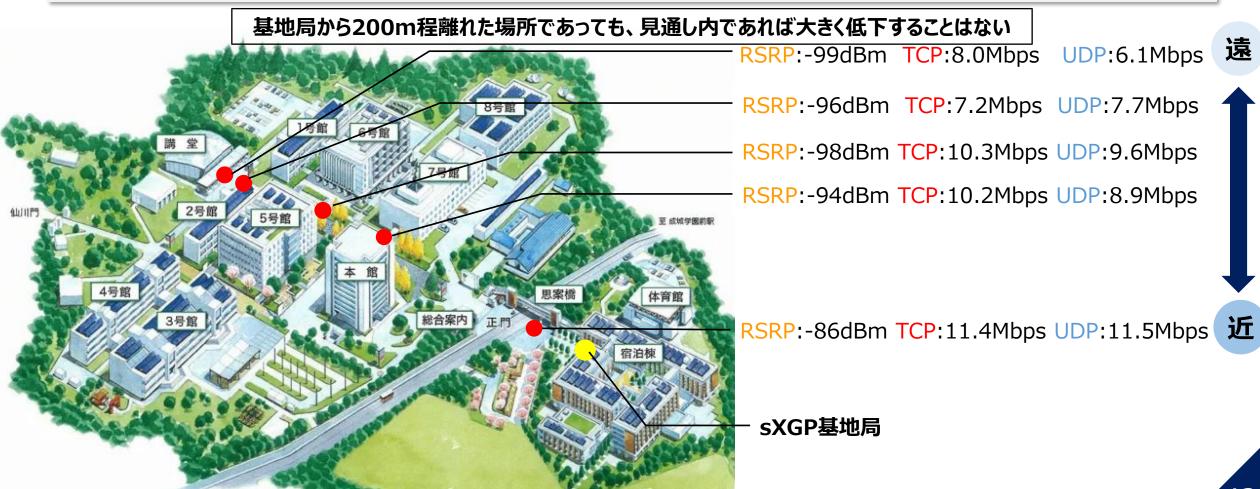
### 検証 1-1 電波伝搬特性 検証結果 (スループット-TCP)



### 検証1-1 電波伝搬特性 検証結果 (スループット-UDP)



- 検証1-1同様、屋外の約200mの直線環境を用いて、合計5地点において、受信電波強度とスループット(下りのみ)を測定している。
- 測定ツールとして、受信電波強度はNetwork Cell Infoアプリを、スループットはmagic iperfアプリ(iperf2)を使用し、下り30Mbpsのトラヒックを1分間印加し、平均値を算出している。
- APの周波数はFO(既存の周波数)とし、送信出力は最大としている。



## 検証2 複数端末同時通信

### 検証2 複数端末同時通信

- 同時に複数台の端末で通信した際のスループット(プロトコルはTCP、UDP)を測定する。
- 測定ツールとして、magic iperfアプリ(iperf2)を使用し、上り:5Mbps、下り:30Mbpsのトラヒックを1分間印加し、平均値を算出している。
- APの周波数はF2(新たに追加された周波数)とし、送信出力は最大としている。
- APと端末間は約1m離し配置している.



sXGP基地局



### TCP - 上り

■ 同時通信可能であり、スループットも按分される。

トラヒックを印加した端末数	1台目	2台目	3台目	4台目	5台目	6台目	7台目	8台目	9台目	10台目	計
1	2.90										2.90
2	1.52	1.51									3.03
3	0.95	1.19	0.95								3.09
4	0.77	0.78	0.76	0.76							3.07
5	0.59	0.68	0.59	0.66	0.59						3.11
6	0.52	0.52	0.52	0.52	0.53	0.53					3.14
7	0.46	0.44	0.44	0.47	0.44	0.44	0.44				3.12
8	0.40	0.40	0.40	0.39	0.40	0.39	0.39	0.40			3.16
9	0.36	0.40	0.37	0.35	0.36	0.35	0.34	0.34	0.34		3.21
10	0.33	0.30	0.33	0.32	0.32	0.32	0.31	0.32	0.30	0.29	3.14

### TCP - 下り

■ 同時通信可能であり、スループットも平均すると按分されているが、通信途中で途切れる事象が発生する。

トラヒックを印加した端末数	1台目	2台目	3台目	4台目	5台目	6台目	7台目	8台目	9台目	10台目	計
1	11.50										11.50
2	5.62	5.84									11.46
3	4.18	3.65	3.76								11.59
4	2.98	2.91	2.91	2.94							11.74
5	2.34	2.35	2.37	2.37	2.37						11.80
6	1.99	1.98	1.98	1.97	1.86	1.94					11.72
10	1.19	1.14	1.18	1.37	1.21	1.15	1.20	1.33	1.19	1.18	12.14

### TCP - 下り (端末1台、2台を用いた通信)

167 - ドリ	(姉木エロ、ノロで	用いに週間!		0.89 nort 5001 connected with [_4] local 45.45.0.	.87 port 5001 connected with
[ 4] local 45.45.0.89 port 5001 connected with			45.45.0.1 port 4 [ ID] Interval	2台通信 [ID] Inte 2台	台通信 /idth
45.45.0.1 port 42228 [ID] Inter <b>2台通信</b>	440	2/2		】(1台目)	A⊟ 1 2 Mbits/sec
[4] 0.0- (4] 1.0- <b>1台通信</b> M				Sec [ 4] 2.0	<b>2</b> 11151to, 555
[ 4] 2.0- 3.0 sec 1.37 MBytes 11.5 M		Interval Transf		665 KBytes 5.44 Mbits/sec [ 4] 4.0- 5.0 sec	730 KBytes 5.98 Mbits/sec 730 KBytes 5.98 Mbits/sec
[4] 4.0-5.0 sec 1.37 MBytes 11.5 M	•	[ 4] 21.0-22.0 sec 694 KB		669 KBytes 5.48 Mbits/sec [ 4] 6.0-7.0 sec	731 KBytes 5.99 Mbits/sec
[ 4] 5.0-6.0 sec 1.37 MBytes 11.5 M [ 4] 6.0-7.0 sec 1.37 MBytes 11.5 M [ 4] 22.0-23	3.0 sec 706 KBytes 5.78 Mbits/sec	[ 4] 22.0-23.0 sec 622 KB	ytes 5.09 Mbits/sec	658 KBytes 5.39 Mbits/sec [ 4] 7.0-8.0 sec 669 KBytes 5.48 Mbits/sec [ 4] 8.0-9.0 sec	725 KBytes 5.94 Mbits/sec
[ 4] 7.0- 8.0 sec 1.37 MBytes 11.5 M	1.0 sec 29.0 KBytes 238 Kbits/sec	[ 4] 23.0-24.0 sec 0.00 By	tes 0.00 bits/sec	c 691 KBytes 5.66 Mbits/sec[ 4] 9.0-10.0 sec c 672 KBytes 5.50 Mbits/sed 4] 10.0-11.0 sec	c 734 KBytes 6.01 Mbits/sec
[ 4] 9.0-10.0 sec 1.37 MBytes 11.5 M [ 4] 24.0-25	5.0 sec 597 KBytes 4.89 Mbits/sec	[ 4] 24.0-25.0 sec 928 KB	·	a 670 KD, the a E 40 Mb; to /ood 41 11 0 12 0 ood	c 734 KBytes 6.01 Mbits/sec
4     0- 20 sec   3/ MBvtes    5 N	5.0 sec 1.09 MBytes 9.15 Mbits/sec			Lo 604 K Duton E 61 Mbito/ond 4] 12 0 14 0 000	c 732 KBytes 6.00 Mbits/sec
1 /1 13 ()=1/1 () eac 1 3 / MRvtae 11 5 M = = =	7.0 sec 0.00 Bytes 0.00 bits/sec	[ 4] 26.0-27.0 sec 0.00 By		c 694 KBytes 5.69 Mbits/sed 4] 15.0-16.0 sed	c 730 KBytes 5.98 Mbits/sec
		,		c 687 KBytes 5.63 Mbits/sed 4] 16.0-17.0 sec c 689 KBytes 5.64 Mbits/sed 4] 17.0-18.0 sec	c 694 KBytes 5.69 Mbits/sec
	3.0 sec 0.00 Bytes 0.00 bits/sec	[ 4] 27.0-28.0 sec 2.46 ME		c 708 KBytes 5.80 Mbits/sed 4 19.0-20.0 sed	c 700 KBytes 5.73 Mbits/sec
/	0.0 sec 2.36 MBytes 19.8 Mbits/sec		•	c 706 KBytes 5.78 Mbits/sed 4] 20.0-21.0 sed 693 KBytes 5.68 Mbits/sed 4] 21.0-22.0 sed	
1 41 21 (1-22 () sec 485 KBytes 3 97 M = -	0.0 sec 680 KBytes 5.57 Mbits/sec	[ 4] 29.0-30.0 sec 730 KB	•	706 KBytes 5.78 Mbits/sed 4 22.0-23.0 sed 9.0 KBytes 238 Kbits/sec[4] 23.0-24.0 sed	c 622 KBytes 5.09 Mbits/sec
[ 4] 22.0-23.0 sec 2.77 MBytes 23.3 N [ 4] 30.0-31 [ 4] 23.0-24.0 sec 539 KBytes 4.42 N [ 4]	0 sec 248 KBytes 2.03 Mbits/sec	[ 4] 30.0-31.0 sec 718 KB	•	7 KBytes 4.89 Mbits/sed 4] 24.0-25.0 sed MBytes 9.15 Mbits/se& 4] 25.0-26.0 sed	c 928 KBytes 7.60 Mbits/sec
[ 4] 24.0-25.0 sec 2.21 MBytes 18.6 N 4 31.0-32	2.0 sec 0.00 Bytes 0.00 bits/sec	[ 4] 31.0-32.0 sec 665 KB	ytes 5.44 Mbits/sec	Bytes 0.00 bits/sec [ 4] 26.0-27.0 sec	c 0.00 Bytes 0.00 bits/sec
[ 4] 25.0-26.0 sec 1.02 MBytes 8.52 N [ 4] 26.0-27.0 sec 1.72 MBytes 14.4 N [ 4] 32.0-33	3.0 sec 1.80 MByte <mark>s 15.1 Mbits/sec</mark>	[ 4] 32.0-33.0 sec 667 KB	ytes 5.47 Mbits/sec	vtes 0.00 bits/sec [ 4] 27.0-28.0 sec 8ytes 19.8 Mbits/sec 4] 28.0-29.0 sec	c 701 KBytes 5.75 Mbits/sec
[ 4] 28.0-29.0 sec 1.38 MBytes 11.5 N	1.0 sec 731 KBytes 5.99 Mbits/sec	[ 4] 33.0-34.0 sec 666 KB	vtes 5.46 Mbits/sec	c 666 tes 5.57 Mbits/sed 4] 29.0-30.0 sed c 248 KBytes 2.03 Mbits/sed 4] 30.0-31.0 sed	: 730 KBytes 5.98 Mbits/sec : 718 KBytes 5.88 Mbits/sec
1 /1 /29 (1-30 () eac 1 36 MBv/fac 11 /1 M = = =	5.0 sec 730 KBytes 5.98 Mbits/sec	5 -	•	a 0 00 Dutas 0 00 hits/sss [ 4] 21 0 22 0 sss	c 665 KBytes 5.44 Mbits/sec
[ 4] 31.0-32.0 sec 1.37 MBytes 11.5 N L ] 3 11.5 N L [ 4] 32.0-33.0 sec 1.37 MBytes 11.5 Mbits/sec		[ 1] 3 110 3310 300 070 112	JE 41 34 0-35 0 6	c 731 KBytes 5.99 Mbits/sed 4] 33.0-34.0 sec sec 730 KBytes 5.98 Mbits/sed 4] 34.0-35.0 sec	c 666 KBytes 5.46 Mbits/sec
[ 4] 33.0-34.0 sec 1.37 MBytes 11.5 Mbits/sec	1台通信			sec 691 KBytes 5.66 Mbits/sed 4] 35.0-36.0 sec	c 727 KBytes 5.95 Mbits/sec
[ 4] 34.0-35.0 sec 1.36 MBytes 11.4 Mbits/sec [ 4] 35.0-36.0 sec 1.37 MBytes 11.5 Mbits/sec		<u> </u>	[ 4] 37.0-38.0 s	sec 673 KBytes 5.51 Mbits/sed 4] 36.0-37.0 sec sec 684 KBytes 5.61 Mbits/sed 4] 37.0-38.0 sec	c 676 KBytes 5.54 Mbits/sec
[ 4] 36.0-37.0 sec 1.37 MBytes 11.5 Mbits/sec [ 4] 37.0-38.0 sec 1.37 MBytes 11.5 Mbits/sec	Interval Transfer	Bandwidth	[ 4] 39.0-40.0 s	sec	c 732 KBytes 6.00 Mbits/sec
[ 4] 38.0-39.0 sec 1.37 MBytes 11.5 Mbits/sec [ 4] 39.0-40.0 sec 1.37 MBytes 11.5 Mbits/sec	[ 4] 47.0-48.0 sec 1.37 MBytes		[ 4] 40.0-41.0 s [ 4] 41.0-42.0 s	sec 670 KBytes 5.49 Mbits/sed 4] 40.0-41.0 sec sec 659 KBytes 5.40 Mbits/sed 4] 41.0-42.0 sec	: 731 KBytes 5.99 Mbits/sec c 732 KBytes 6.00 Mbits/sec
[ 4] 40.0-41.0 sec 1.37 MBytes 11.5 Mbits/sec [ 4] 41.0-42.0 sec 1.37 MBytes 11.5 Mbits/sec	[ 4] 48.0-49.0 sec 1.37 MBytes		[ 4] 42.0-43.0 s	sec 669 KBytes 5.48 Mbits/sed 4] 42.0-43.0 sec sec 392 KBytes 3.21 Mbits/sed 4] 43.0-44.0 sec	c 721 KBytes 5.91 Mbits/sec
[ 4] 42.0-43.0 sec 1.36 MBytes 11.4 Mbits/sec [ 4] 43.0-44.0 sec 1.37 MBytes 11.5 Mbits/sec	[ 4] 49.0-50.0 sec 1.37 MBytes	11.5 Mbits/sec	[ 4] 44.0-45.0 s	sec 0.00 Bytes 0.00 bits/sec [ 4] 44.0-45.0 sec	c 0.00 Bytes 0.00 bits/sec
[ 4] 44.0-45.0 sec 1.37 MBytes 11.5 Mbits/sec	[ 4] 50.0-51.0 sec 804 KBytes	6.59 Mbits/sec	[ 4] 46.0-47.0 s	sec 1.66 MBytes 13.9 Mbits/se& 4] 45.0-46.0 sec sec 730 KBytes 5.98 Mbits/se& 4] 46.0-47.0 sec	c 1.04 MBytes 8.69 Mbits/sec
[ 4] 45.0-46.0 sec 1.37 MBytes 11.5 Mbits/sec [ 4] 46.0-47.0 sec 1.37 MBytes 11.5 Mbits/sec	[ 4] 51.0-52.0 sec 1.59 MBytes	13.4 Mbits/sec		sec 717 KBytes 5.87 Mbits/sed 4] 47.0-48.0 sec sec 725 KBytes 5.94 Mbits/sed 4] 48.0-49.0 sec	
[ 4] 47.0-48.0 sec 1.37 MBytes 11.5 Mbits/sec [ 4] 48.0-49.0 sec 1.37 MBytes 11.5 Mbits/sec	[ 4] 52.0-53.0 sec 0.00 Bytes 0.			sec 701 KBytes 5.75 Mbits/sed 4] 49.0-50.0 sec sec 696 KBytes 5.70 Mbits/sed 4] 50.0-51.0 sec	
[ 4] 49.0-50.0 sec 1.37 MBytes 11.5 Mbits/sec [ 4] 50.0-51.0 sec 804 KBytes 6.59 Mbits/sec	[ 4] 53.0-54.0 sec 3.11 MBytes		[ 4] 51.0-52.0 s	sec 717 KBytes 5.87 Mbits/sed 4] 51.0-52.0 sec sec 468 KBytes 3.83 Mbits/sed 4] 52.0-53.0 sec	c 580 KBytes 4.76 Mbits/sec
[ 4] 51.0-52.0 sec 1.59 MBytes 13.4 Mbits/sec [ 4] 52.0-53.0 sec 0.00 Bytes 0.00 bits/sec	[ 4] 54.0-55.0 sec 149 KBytes		[ 4] 53.0-54.0 s	sec 0.00 Bytes 0.00 bits/sec [ 4] 53.0-54.0 sec	c 450 KBytes 3.68 Mbits/sec
[ 4] 53.0-54.0 sec 3.11 MBytes 26.1 Mbits/sec			[ 4] 55.0-56.0 s	sec 1.53 MBytes 12.8 Mbits/se& 4] 54.0-55.0 sec sec 666 KBytes 5.46 Mbits/sed 4] 55.0-56.0 sec	c 1.78 MBytes 15.0 Mbits/sec
[ 4] 54.0-55.0 sec 149 KBytes 1.22 Mbits/sec [ 4] 55.0-56.0 sec 2.59 MBytes 21.7 Mbits/sec	[ 4] 55.0-56.0 sec 2.59 MBytes		[ 4] 57.0-58.0 s	sec 677 KBytes 5.55 Mbits/sed 4] 56.0-57.0 sec sec 728 KBytes 5.97 Mbits/sed 4] 57.0-58.0 sec	c 689 KBytes 5.64 Mbits/sec
[ 4] 56.0-57.0 sec 631 KBytes 5.17 Mbits/sec [ 4] 57.0-58.0 sec 2.13 MBytes 17.9 Mbits/sec	[ 4] 56.0-57.0 sec 631 KBytes			sec 687 KBytes 5.63 Mbits/sed 4] 58.0-59.0 sec sec 724 KBytes 5.93 Mbits/sed 4] 59.0-60.0 sec	
[ 4] 58.0-59.0 sec 1.36 MBytes 11.4 Mbits/sec [ 4] 59.0-60.0 sec 1.37 MBytes 11.5 Mbits/sec	[ 4] 57.0-58.0 sec 2.13 MBytes		[ 4] 60.0-61.0 s	sec 730 KBytes 5.98 Mbits/sed 4] 60.0-61.0 sec sec 725 KBytes 5.94 Mbits/sed 4] 61.0-62.0 sec	c 658 KBytes 5.39 Mbits/sec
[ 4] 60.0-61.0 sec 1.37 MBytes 11.5 Mbits/sec [ 4] 61.0-62.0 sec 1.37 MBytes 11.5 Mbits/sec	[ 4] 58.0-59.0 sec 1.36 MBytes	11.4 Mbits/sec	[ 4] 62.0-63.0 s	sec 723 KBytes 5.92 Mbits/sed 4] 62.0-63.0 sec sec 694 KBytes 5.69 Mbits/sed 4] 63.0-64.0 sec	c 680 KBytes 5.57 Moits/sec
[ 4] 0.0-62.1 sec 85.0 MBytes 11.5 Mbits/sec	[ 4] 59.0-60.0 sec 1.37 MBytes	11.5 Mbits/sec		ec 44.2 MBytes 5.72 Mbits/sed 4] 0.0-64.1 sec	

### TCP - 下り(端末5台を用いた通信)

	A	Di Interval     10.0 - 1.0     2	[ID] Interval 3	bits/sed [ 4] 3.0- 4.0 sec 294 KBytes 2.4	11 Mbits/sec [ 4] 3.0- 4.0 sec 257 KByte	I1 Mbits/sec es 2.42 Mbits/sec es 2.11 Mbits/sec	
[ 4] 5.0-6 [ 4] 6.0-7. [ 4] 7.0-8. [ 4] 8.0-9. [ 4] 9.0-90. [ 4] 10.0-1. [ 4] 11.0-1. [ 4] 13.0-1. [ 4] 15.0-1. [ 4] 15.0-1. [ 4] 15.0-1. [ 4] 15.0-1. [ 4] 15.0-1. [ 4] 12.0-2. [ 4] 20.0-2. [ 4] 22.0-2. [ 4] 23.0-2. [ 4] 23.0-2. [ 4] 24.0-2.	0.0 sec   267   28   28   28   28   28   28   28   2	14] 4.0 - 5.0 sec 2/37	## 1	1bits/sed	4 Mbits/sec	se 1.95 Mbits/sec es 2.10 Mbits/sec es 1.91 Mbits/sec es 1.91 Mbits/sec es 1.91 Mbits/sec es 1.91 Mbits/sec Mbits/sec [ 4] 3.0 Mbits/sec [ 4] 4.0 Mbits/sec [ 4] 5.0 Mbits/sec [ 4] 6.0	Sample
[ 4] 27.0-28 [ 4] 28.0-25 [ 4] 29.0-36 [ 4] 30.0-33 [ 4] 31.0-33 [ 4] 33.0-34 [ 4] 34.0-33 [ 4] 35.0-33 [ 4] 37.0-38	80.0 sec 26.	9.0 sec 267 KByte	2.19 Mbits/sec 2.33 Mbits/sec 2.33 Mbits/sec 2.40 4] 33.0-33.0 sec 293 KBytes 2.40 2.61 4] 33.0-35.0 sec 293 KBytes 2.42 2.62 4] 34.0-35.0 sec 283 KBytes 2.32 2.62 4] 35.0-36.0 sec 245 KBytes 2.32 2.62 4] 35.0-36.0 sec 245 KBytes 2.00	[ 4] 8.0- 9.0 sec [ 4] 9.0-10.0 sec Mbits/sec [ 4] 32.0-33.0 sec 245 KBytes 2 Mbits/sec [ 4] 33.0-34.0 sec 297 KBytes 2 Mbits/sec [ 4] 34.0-35.0 sec 265 KBytes 2 Mbits/sec [ 4] 35.0-36.0 sec 272 KBytes 2 Mbits/sec [ 4] 36.0-37.0 sec 311 KBytes 2 Mbits/sec [ 4] 36.0-38.0 sec 404 KBytes 1	260 KBytes 2.13 263 KBytes 2.15 00 Mbits/sec [ 4] 32.0-33.0 sec 257 KBy 43 Mbits/sec [ 4] 33.0-34.0 sec 273 KBy 22 Mbits/sec [ 4] 35.0-36.0 sec 288 KBy 55 Mbits/sec [ 4] 36.0-37.0 sec 205 KBy 15 Mbits/sec [ 4] 37.0-38.0 sec 0.00 Byte	Mbits/sec [ 4] 8.0 Mbits/sec [ 4] 9.0  Tes 2.12 Mbits/sec [ 4] 9.0  Tes 2.4 Mbits/sec [ 4] 9.0  Tes 2.4 Mbits/sec [ 4] 9.0	- 9.0 sec 286 KBytes 2.34 Mbits/se -10.0 sec 280 KBytes 2.29 Mbits/se 3台目
[ 4] 47 44 [ 4] 44 [ 4] 45 [ 4] 45 [ 4] 46.0 [ 4] 48.0- [ 4] 49.0-5 [ 4] 51.0-5 [ 4] 52.0-5; [ 4] 55.0-5; [ 4] 55.0-5; [ 4] 55.0-5; [ 4] 55.0-5; [ 4] 55.0-5; [ 4] 55.0-5;	34 [ 4] 38.0-39.0 55 [ 4] 39.0-40.0 67 [ 4] 40.0-41.0	•	2.62 Mbits/sec [ 4 1.12 Mbits/sec [ 4 .00 bits/sec	35.0-36.0 sec 2 36.0-37.0 sec 3 37.0-38.0 sec 1 38.0-39.0 sec 0. 39.0-40.0 sec 0. 4 40.0-41.0 sec 0.	0.00 bits 0.00 bits 0.00 bits	its/sec [ 4] 35.0- its/sec [ 4] 36.0- its/sec [ 4] 37.0- /sec [ 4] 38.0- /sec [ 4] 39.0- /sec [ 4] 40.0-	transfer         Bandwidth           36.0 sec         288 KBytes         2.36 Mbits/sec           37.0 sec         205 KBytes         1.68 Mbits/sec           38.0 sec         0.00 Bytes         0.00 bits/sec           39.0 sec         0.00 Bytes         0.00 bits/sec           40.0 sec         0.00 Bytes         0.00 bits/sec           41.0 sec         0.00 Bytes         0.00 bits/sec           42.0 sec         503 KBytes         4.12 Mbits/sec
[ 4] 59.0-60 [ 4] 60.0-61 [ 4] 61.0-62 [ 4] 62.0-63 [ 4] 63.0-64 [ 4] 64.0-65	<sup>2</sup> [ 4] 42.0-43.0	sec 889 KBytes		l] 41.0-42.0 sec 1 l] 42.0-43.0 sec 5	79 KBytes   1.47 Mb 39 KBytes   4.41 Mb		42.0 sec

### TCP - 下り(端末10台を用いた通信)

f 41 0 0 4 f	[ID] Interval [ID] Interval [ID] Interval hits/sec [14] 0.0-1.0 3 4	th hits/sec	[ ID] Inte	
[ 4] 0.0-1.0 [ 4] 1.0-2.0 [ 4] 2.0-3.0 [ 4] 3.0-4.0 s	bits/sec [ 4] 1.0-2.0	totts/sec /bits/sec /bits/sec /tes 1.33 Mbits/sec	[ 4] 0.0- <b>10台目</b>	s/sec s/sec
[ 4] 4.0- 5.0 s [ 4] 5.0- 6.0 s	sec 134 KBytes 1.10 Mbits/sec [4] 4.0-5.0 sec 144 KBytes 1.18 Mbits/sec [4] 4.0-5.0 sec 133 KBytes 1.10 Mbits/sec [4] 5.0-6.0 sec 134 KBytes 1.10 Mbits/sec [4] 5.0-6.0 sec 136 KBytes 1.10 Mbits/sec [4] 6.0-7.0 sec 136 KBytes 1.11 Mbits/sec [4] 6.0-7.0 sec 132 KBytes 1.11 Mbits/sec	rtes 1.09 Mbits/sec rtes 1.19 Mbits/sec	[ 4] 4.0-5.0 sec 133 KBytes 1.09 Mbits/ [ 4] 5.0-6.0 sec 146 KBytes 1.19 Mbits/ [ 4] 6.0-7.0 sec 132 KBytes 1.08 Mbits/	s/sec s/sec
[ 4] 7.0-8.0 s [ 4] 8.0-9.0 s	sec 140 KBytes 1.15 Mbits/sec [ 4] 7.0-8.0 sec 136 KBytes 1.11 Mbits/sec [ 4] 7.0-8.0 sec 143 KBy	rtes 1.17 Mbits/sec	[ 4] 7.0- 8.0 sec 143 KBytes 1.17 Mbits/	s/sec
[ 4] 0-10.0 [ 4] 10 11.0 [ 4] 11.	1台目 Interval Transfer <u>Bandwidth</u>	Interval	2台目 按 Transfer <u>Bandwid</u>	分されている 3台目 lth_ Interval Transfer <u>Bandwidth</u>
[ 4] 13.0- [ 4] 14.0-1 [ 4] 15.0-16	[ 4] 4.0- 5.0 sec 134 KBytes 1.10 Mbits/sec		144 KBytes 1.18 Mbits/se	
[ 4] 16.0-17. [ 4] 17.0-18.0			134 KBytes 1.10 Mbits/se	
[ 4] 18.0-19.0 [ 4] 19.0-20.0 [ 4] 20.0-21.0	, , ,	10 .0	136 KBytes 1.11 Mbits/se	
[ 4] 21.0-22.0 [ 4] 22.0-23.0 [ 4] 23.0-24.0	[ 4] 7.0-8.0 sec 140 KBytes 1.15 Mbits/sec [ 4] 8.0-9.0 sec 144 KBytes 1.18 Mbits/sec		136 KBytes   1.11 Mbits/se 137 KBytes   1.12 Mbits/se	1
[ 4] 24.0-25.0 [ 4] 25.0-26.0 [ 4] 26.0-27.0	[ 4] 8.0- 9.0 sec 144 KBytes 1.18 Mbits/sec [ 4] 9.0-10.0 sec 141 KBytes 1.16 Mbits/sec		130 KBytes 1.07 Mbits/s	, , , , , , , , , , , , , , , , , , ,
[ 4] 27.0-28.0 [ 4] 28.0-29.0 [ 4] 29.0-30.0	1 5 5 · · · · · · · · · · · · · · · · ·	·   • •	,	_   <del>-</del> -
[ 4] 30.0-31.0 [ 4] 31.0-32.0	sec 136 KBytes 1.14 Mbits/sec [ 4] 31.0-32.0 sec 136 KBytes 1.11 Mbits/sec [ 4] 31.0-32.0 sec 123 KB sec 136 KBytes 1.11 Mbits/sec [ 4] 32.0-33.0 sec 124 KBytes 1.02 Mbits/sec [ 4] 32.0-33.0 sec 132 KB	sytes 1.01 Mbits/sec	[ 4] 31.0-32.0 sec 123 KBytes 1.01 Mbits [ 4] 32.0-33.0 sec 132 KBytes 1.08 Mbits	ts/sec
[ 4] 33.0-34.0 [ 4] 34.0-35.0	sec 122 KBytes 996 Kbits/sec [ 4] 33.0-34.0 sec 133 KBytes 1.09 Mbits/sec [ 4] 33.0-34.0 sec 127 KB sec 130 KBytes 1.07 Mbits/sec [ 4] 34.0-35.0 sec 143 KBytes 1.17 Mbits/sec [ 4] 34.0-35.0 sec 133 KBytes 1.17 Mbits/sec	ytes 1.04 Mbits/sec sytes 1.09 Mbits/sec	[ 4] 33.0-34.0 sec 127 KBytes 1.04 Mbits [ 4] 34.0-35.0 sec 133 KBytes 1.09 Mbits	ts/sec ts/sec
[ 4] 36.0-37.0 [ 4] 37.0-3 <u>8.0</u>	sec 134 KBytes 1.10 Mbits/sec [ 4] 35.0-36.0 sec 148 KBytes 1.22 Mbits/sec [ 4] 35.0-36.0 sec 130 KE sec 4.24 KBytes 3.48 Kbits/sec [ 4] 36.0-37.0 sec 151 KBytes 1.24 Mbits/sec [ 4] 36.0-37.0 sec 127 KE sec 0.00 Bytes 0.00 bits/sec [ 4] 37.0-38.0 sec 143 KBytes 1.17 Mbits/sec [ 4] 37.0-38.0 sec 122 KE	sytes 1.04 Mbits/sec	[ 4] 35.0-36.0 sec 130 KBytes 1.07 Mbits [ 4] 36.0-37.0 sec 127 KBytes 1.04 Mbits [ 4] 37.0-38.0 sec 122 KBytes 996 Kbits	ts/sec
[ 4] 36.0-37.0 [ 4] 37.0-38.0 [ 4] 38.0-3 [ 4] 39.0-4 [ 4] 40.0-4	sec 4.24 KBytes 34.8 Kbits/sec	lytes 1.04 Mbits/sec lytes 996 Kbits/sec	[ 4] 36.0-37.0 sec 127 KBytes 1.04 Mbits [ 4] 37.0-38.0 sec 122 KBytes 996 Kbits	ts/sec s/sec 3台目
[ 4] 36.0-37.0 [ 4] 37.0-38.0 [ 4] 38.0-3 [ 4] 39.0-4	sec 4.24 KBytes 34.8 Kbits/sec	lytes 1.04 Mbits/sec lytes 996 Kbits/sec Interval	[ 4] 36.0-37.0 sec 127 KBytes 1.04 Mbits [ 41 37.0-38.0 sec 122 KBytes 996 Kbits 2台目 Transfer Bandwidth	s/sec s/sec 3台目 Interval Transfer Bandwidth
[ 4] 36.0-37.0 [ 4] 37.0-38.0 [ 4] 38.0-3 [ 4] 39.0-4 [ 4] 40.0-4	sec 4.24 KBytes 34.8 Kbits/sec 4.3 5.0-37.0 sec 151 KBytes 1.24 Mbits/sec 14] 36.0-37.0 sec 127 KB sec 0.00 Bytes 0.00 bits/sec 4.3 37.0-38.0 sec 122 KB	Interval  [ 4] 35.0-36.0 sec	[ 4] 36.0-37.0 sec 127 KBytes 1.04 Mbits 1 41 37.0-38.0 sec 122 KBytes 996 Kbits <b>2台目 Transfer Bandwidth</b> 148 KBytes 1.22 Mbits/s	Sec [ 4] 35.0-36.0 sec 130 KBytes 1.07 Mbits/sec
[ 4] 36.0-37.0 [ 4] 37.0-38.0 [ 4] 38.0-3 [ 4] 39.0-4 [ 4] 40.0-4	sec 4.24 KBytes 34.8 Kbits/sec	Interval  [ 4] 35.0-36.0 sec	[ 4] 36.0-37.0 sec 127 KBytes 1.04 Mbits [ 41 37.0-38.0 sec 122 KBytes 996 Kbits 2台目 Transfer Bandwidth	Sec [ 4] 36.0-37.0 sec 127 KBytes 1.04 Mbits/sec 1.05 KBytes 1.04 Mbits/sec 1.05 KBytes 1.04 Mbits/sec 1.05 KBytes 1.04 Mbits/sec 1.05 KBytes 1.05 KB
[ 4] 36.0-37.0 [ 4] 37.0-38.0 [ 4] 38.0-3 [ 4] 39.0-4 [ 4] 40.0-4 [ 4] 41.0-4 [ 4] 20-4 [ 4] 4] [ 4] 4 [ 4] 4 [ 4] 4 [ 4] 4 [ 4] 4 [ 4] 48.1 [ 4] 49.0 [ 4] 51.0-1	### Sec 4.24 KBytes 34.8 Kbits/sec 4 4 36.0-37.0 sec 151 KBytes 1.24 Mbits/sec 4 36.0-37.0 sec 122 KBytes 0.00 Bytes 0.00 bits/sec 143 KDytes 1.17 Mbits/sec 4 37.0-38.0 sec 122 KBytes 1.17 Mbits/sec 4 37.0-38.0 sec 122 KBytes 1.17 Mbits/sec 122 KBytes 1.10 Mbits/sec 122 KBytes	Interval [ 4] 35.0-36.0 sec [ 4] 36.0-37.0 sec [ 4] 37.0-38.0 sec [ 4] 38.0-39.0 sec	4  36.0-37.0 sec	### Sec
[ 4] 36.0-37.0 [ 4] 37.0-38.0 [ 4] 38.0-3 [ 4] 39.0-4 [ 4] 40.0-4 [ 4] 41.0-4 [ 4] 42.0-4 [ 4] 41 [ 4] 4 [ 4] 4 [ 4] 44 [ 4] 44 [ 4] 45.0 [ 4] 55.0-5 [ 4] 55.0-5 [ 4] 55.0-5	### Sec 4.24 KBytes 34.8 Kbits/sec 4.37.0-38.0 sec 151 KBytes 1.24 Mbits/sec 4.37.0-38.0 sec 122 KBytes 0.00 Bytes 0.00 bits/sec 122 KBytes 1.24 Mbits/sec 4.37.0-38.0 sec 122 KBytes 1.17 Mbits/sec 4.37.0-38.0 sec 122 KBytes 1.10 Mbits/sec 122 KBytes 1.10 Mbits/sec 122 KBytes 1.10 Mbits/sec 122 KBytes 1.10 Mbits/sec 1.1	Interval [ 4] 35.0-36.0 sec [ 4] 36.0-37.0 sec [ 4] 37.0-38.0 sec [ 4] 38.0-39.0 sec [ 4] 39.0-40.0 sec	## 136.0-37.0 sec 127 KBytes 1.04 Mbits 1.0	Sec   1   35.0-36.0 sec   127   KBytes   1.04   Mbits/sec   138.0-39.0 sec   140   KBytes   1.15   Mbits/sec   141   39.0-40.0 sec   123   KBytes   1.01   Mbits/sec   123   KBytes   1.15   Mbits/sec   123   KBytes   1.15   Mbits/sec   123   KBytes   1.01   Mbits/sec   1.01   Mbits
[ 4] 36.0-37.0 [ 4] 37.0-38.0 [ 4] 38.0-3 [ 4] 39.0-4 [ 4] 40.0-4 [ 4] 41.0-4 [ 4] 42.0-4 [ 4] 4] [ 4] 4 [ 4] 4 [ 4] 4 [ 4] 44 [ 4] 44 [ 4] 44 [ 4] 49.0 [ 4] 55.0-5 [ 4] 55.0-5 [ 4] 55.0-5 [ 4] 55.0-5 [ 4] 55.0-5 [ 4] 55.0-5	### Sec 4.24 KBytes 34.8 Kbits/sec 4.36.0-37.0 sec 151 KBytes 1.24 Mbits/sec 4.37.0-38.0 sec 122 KBytes 0.00 Bytes 0.00 bits/sec 122 KBytes 1.24 Mbits/sec 4.37.0-38.0 sec 122 KBytes 1.17 Mbits/sec 4.37.0-38.0 sec 122 KBytes 1.17 Mbits/sec 1.10 M	Interval [ 4] 35.0-36.0 sec [ 4] 36.0-37.0 sec [ 4] 37.0-38.0 sec [ 4] 38.0-39.0 sec [ 4] 39.0-40.0 sec [ 4] 40.0-41.0 sec	## 136.0-37.0 sec 127 KBytes 1.04 Mbits 1.04 Mbits 1.22 KBytes 996 Kbits  ## 148 KBytes 1.22 Mbits/s 1.51 KBytes 1.24 Mbits/s 1.43 KBytes 1.17 Mbits/s 1.43 KBytes 1.17 Mbits/s 1.69.3 KBytes 568 Kbits/s 0.00 Bytes 0.00 bits/sec 0.00 Bytes 0.00 bits/sec	### Sec
[ 4] 36.0-37.0 [ 4] 37.0-38.0 [ 4] 38.0-3 [ 4] 39.0-4 [ 4] 40.0-4 [ 4] 41.0-4 [ 4] 42.0-4 [ 4] 42.0-4 [ 4] 43.0 [ 4] 44 [ 4] 47 [ 4] 48.0 [ 4] 49.0 [ 4] 51.0-1 [ 4] 52.0-5 [ 4] 55.0-5 [ 4] 55.0-5 [ 4] 55.0-5 [ 4] 57.0-5 [ 4] 58.0-5 [ 4] 58.0-5	### Sec 4.24 KBytes 34.8 Kbits/sec 4.34 Kbytes 1.24 Mbits/sec 1.24 KBytes 1.24 Mbits/sec 1.24 KBytes 1.24 Mbits/sec 1.24 KBytes 1.24 KBytes 1.17 Mbits/sec 1.24 KBytes 1.10 Mbits/sec 1.24 KBytes 1.24 K	Interval [ 4] 35.0-36.0 sec [ 4] 36.0-37.0 sec [ 4] 37.0-38.0 sec [ 4] 38.0-39.0 sec [ 4] 39.0-40.0 sec [ 4] 40.0-41.0 sec [ 4] 41.0-42.0 sec	## 136.0-37.0 sec 127 KBytes 1.04 Mbits 1.04 Mbits 1.22 KBytes 996 Kbits  ## 148 KBytes 1.22 Mbits/s 1.51 KBytes 1.24 Mbits/s 1.43 KBytes 1.24 Mbits/s 1.43 KBytes 1.17 Mbits/s 1.43 KBytes 568 Kbits/s 1.00 Bytes 0.00 bits/sec 0.00 Bytes 0.00 bits/sec 0.00 Bytes 0.00 bits/sec 0.00 Bytes 0.00 bits/sec 0.00 Bytes 0.00 bits/sec	### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ##
[ 4] 36.0-37.0 [ 4] 37.0-38.0 [ 4] 38.0-3 [ 4] 39.0-4 [ 4] 40.0-4 [ 4] 41.0-4 [ 4] 42.0-4 [ 4] 42.0-4 [ 4] 43.0 [ 4] 44.1 [ 4] 44.1 [ 4] 45.0 [ 4] 50.0-5 [ 4] 55.0-5 [ 4] 55.0-6 [ 4] 61.0-6 [ 4] 61.0-6 [ 4] 62.0-6	### Sec 4.24 KBytes 34.8 Kbits/sec 4.36.0-37.0 sec 151 KBytes 1.24 Mbits/sec 4.37.0-38.0 sec 122 KBytes 0.00 Bytes 0.00 bits/sec 122 KBytes 1.24 Mbits/sec 4.37.0-38.0 sec 122 KBytes 1.17 Mbits/sec 4.37.0-38.0 sec 122 KBytes 1.17 Mbits/sec 1.10 M	Interval [ 4] 35.0-36.0 sec [ 4] 36.0-37.0 sec [ 4] 37.0-38.0 sec [ 4] 38.0-39.0 sec [ 4] 39.0-40.0 sec [ 4] 40.0-41.0 sec [ 4] 41.0-42.0 sec [ 4] 42.0-43.0 sec	## 136.0-37.0 sec 127 KBytes 1.04 Mbits 1.04 Mbits 1.22 KBytes 996 Kbits  ## 148 KBytes 1.22 Mbits/s 1.51 KBytes 1.24 Mbits/s 1.43 KBytes 1.17 Mbits/s 1.43 KBytes 1.17 Mbits/s 1.69.3 KBytes 568 Kbits/s 0.00 Bytes 0.00 bits/sec 0.00 Bytes 0.00 bits/sec	### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ##
[ 4] 36.0-37.0 [ 4] 37.0-38.0 [ 4] 38.0-3 [ 4] 39.0-4 [ 4] 40.0-4 [ 4] 41.0-4 [ 4] 42.0-4 [ 4] 4.1 [ 4] 4.1 [ 4] 4.1 [ 4] 4.1 [ 4] 4.2 [ 4] 4.3 [ 4] 4.3 [ 4] 4.3 [ 4] 51.0-1 [ 4] 52.0-5 [ 4] 53.0-5 [ 4] 55.0-5 [ 4] 55.0-6 [ 4] 63.0-6 [ 4] 63.0-6 [ 4] 63.0-6 [ 4] 63.0-6	### Sec 4.24 KBytes 34.8 Kbits/sec 4.37.0 sec 1.21 KBytes 1.24 Mbits/sec 4.37.0-38.0 sec 1.22 KBytes 1.00 bytes 0.00 bits/sec 1.22 KBytes 1.17 Mbits/sec 4.37.0-38.0 sec 1.22 KBytes 1.17 Mbits/sec 4.37.0-38.0 sec 1.22 KBytes 1.17 Mbits/sec 1.10 M	Interval [ 4] 35.0-36.0 sec [ 4] 36.0-37.0 sec [ 4] 37.0-38.0 sec [ 4] 38.0-39.0 sec [ 4] 39.0-40.0 sec [ 4] 40.0-41.0 sec [ 4] 41.0-42.0 sec [ 4] 42.0-43.0 sec [ 4] 43.0-44.0 sec	## 136.0-37.0 sec 127 KBytes 1.04 Mbits 141 37.0-38.0 sec 122 KBytes 996 Kbits  ## 148 KBytes 1.22 Mbits/s  ## 151 KBytes 1.24 Mbits/s  ## 143 KBytes 1.17 Mbits/s  ## 143 KBytes 1.17 Mbits/s  ## 169.3 KBytes 568 Kbits/sec  ## 0.00 Bytes 0.00 bits/sec	### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ##
[ 4] 36.0-37.0 [ 4] 37.0-38.0 [ 4] 38.0-3 [ 4] 39.0-4 [ 4] 40.0-4 [ 4] 41.0-4 [ 4] 42.0-4 [ 4] 42.0-4 [ 4] 43.0 [ 4] 44.0-4 [ 4] 45.0 [ 4] 45.0-5 [ 4] 53.0-5 [ 4] 53.0-5 [ 4] 55.0-5 [ 4] 55.0-5 [ 4] 55.0-5 [ 4] 58.0-5 [ 4] 60.0-6 [ 4] 63.0-6 [ 4] 63.0-6 [ 4] 63.0-6 [ 4] 63.0-6 [ 4] 65.0-6 [ 4] 65.0-6	Transfer   134 KBytes   1.10 Mbits/sec   124 KBytes   1.24 Mbits/sec   1.24 KBytes	Interval [ 4] 35.0-36.0 sec [ 4] 36.0-37.0 sec [ 4] 37.0-38.0 sec [ 4] 38.0-39.0 sec [ 4] 39.0-40.0 sec [ 4] 40.0-41.0 sec [ 4] 42.0-43.0 sec [ 4] 43.0-44.0 sec [ 4] 44.0-45.0 sec [ 4] 45.0-46.0 sec	## 136.0-37.0 sec 127 KBytes 1.04 Mbits	### Sec
[ 4] 36.0-37.0 [ 4] 37.0-38.0 [ 4] 38.0-3 [ 4] 39.0-4 [ 4] 40.0-4 [ 4] 41.0-4 [ 4] 42.0-4 [ 4] 42.0-4 [ 4] 44 [ 4] 44 [ 4] 44 [ 4] 45.0-1 [ 4] 55.0-5 [ 4] 65.0-6 [ 4] 66.0-6 [ 4] 66.0-6 [ 4] 66.0-6 [ 4] 65.0-6 [ 4] 65.0-6	### Page 124 KBytes 34.8 Kbits/sec 14 36.0-37.0 sec 151 KBytes 1.24 Mbits/sec 122 KBytes 0.00 bits/sec 122 KBytes 0.00 bits/sec 122 KBytes 1.17 Mbits/sec 122 KBytes 1.10 Mbits/sec 1.10	Interval [ 4] 35.0-36.0 sec [ 4] 36.0-37.0 sec [ 4] 37.0-38.0 sec [ 4] 38.0-39.0 sec [ 4] 39.0-40.0 sec [ 4] 40.0-41.0 sec [ 4] 41.0-42.0 sec [ 4] 42.0-43.0 sec [ 4] 43.0-44.0 sec [ 4] 44.0-45.0 sec [ 4] 45.0-46.0 sec [ 4] 46.0-47.0 sec	## 136.0-37.0 sec 127 KBytes 1.04 Mbits 141 37.0-38.0 sec 122 KBytes 996 Kbits  ## 148 KBytes 1.22 Mbits/s  ## 151 KBytes 1.24 Mbits/s  ## 143 KBytes 1.24 Mbits/s  ## 143 KBytes 1.24 Mbits/s  ## 1.24 Mbits/s	### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec  ### Sec   ### Sec

### UDP - 上り

■ 同時通信可能であり、スループットも按分される。

トラヒックを印加した端末数	1台目	2台目	3台目	4台目	5台目	6台目	7台目	8台目	9台目	10台目	計
1	2.94										2.94
2	1.72	1.60									3.32
3	1.14	1.32	0.91								3.37
4	0.88	0.89	0.84	0.75							3.36
5	0.65	0.72	0.67	0.68	0.66						3.38
6	0.58	0.56	0.57	0.58	0.57	0.55					3.41
7	0.48	0.41	0.51	0.49	0.47	0.49	0.53				3.39
8	0.41	0.42	0.43	0.43	0.42	0.43	0.44	0.43			3.40
9	0.36	0.42	0.40	0.39	0.38	0.37	0.38	0.36	0.38		3.44
10	0.37	0.36	0.35	0.35	0.34	0.34	0.34	0.33	0.34	0.34	3.46

### UDP - 下り

■ 同時通信可能であり、スループットも按分される。

トラヒックを印加した端末数	1台目	2台目	3台目	4台目	5台目	6台目	7台目	8台目	9台目	10台目	計
1	11.70										11.70
2	5.89	5.73									11.62
3	3.90	3.64	4.11								11.65
4	3.08	2.97	2.76	2.93							11.74
5	2.35	2.34	2.45	2.39	2.07						11.60
6	1.97	1.79	1.94	1.94	1.92	1.73					11.29
10	1.34	1.25	1.23	1.42	1.26	1.40	1.40	1.23	1.24	0.56	12.33

### まとめ

- sXGPはアンライセンスで、コアごとシステム一式を持ち運べるため、色々な環境で気軽に検証することができる。
- コアについて初心者の状態で今回の検証を実施したが、5GCのベースとなるEPCについて先に知っておくことで大きな抵抗なく5GCへ入りやすい。EPCと比較をしながら5GCの理解が進みやすい。
- コアはOSSを利用することでコスト面ではかなりメリットが大きい一方、サポートがないため、不具合(多端末通信時に通信途中で途切れる、どの端末を使ってもアタッチしないことが時々ある)などがある際に初心者では解決が難しいことを実感した。

#### 議論したい内容

• 多端末通信時(TCP-下り)に発生する事象について