

## DAFTAR GAMBAR

|   |    |
|---|----|
| Gambar 3.1 Topologi Upper Layer Encapsulation .....                           | 9  |
| Gambar 3.2 Topologi Under Layer Encapsulation .....                           | 9  |
| Gambar 3.3 Cara Kerja Translasi Gateway .....                                 | 10 |
| Gambar 3.4 Rancangan Topologi .....   | 11 |
| Gambar 3.5 Flowchart IP to NDN .....  | 12 |
| Gambar 3.6 Flowchart NDN to IP .....  | 13 |
| Gambar 3.7 Diagram Komunikasi IP to NDN .....                                 | 14 |
| Gambar 3.8 Diagram Komunikasi NDN to IP .....                                 | 15 |
| Gambar 4.1 Implementasi sistem .....  | 18 |
| Gambar 4.2 Topologi sistem implementasi translasi gateway .....               | 19 |
| Gambar 4.3 Topologi Sub-sistem IP .....                                       | 19 |
| Gambar 4.4 Konfigurasi IP pada Router server dan client IP .....              | 21 |
| Gambar 4.5 Konfigurasi IP pada Router Cisco .....                             | 21 |
| Gambar 4.6 Konfigurasi Routing Protocol RIPv2 .....                           | 22 |
| Gambar 4.7 Pengujian Ping IP 192.168.2.2 oleh Router Server .....             | 22 |
| Gambar 4.8 Pengujian Ping IP 192.168.1.2 oleh Router Cisco .....              | 23 |
| Gambar 4.9 Topologi Sub-sistem NDN .....                                      | 23 |
| Gambar 4.10 Konfigurasi Routing pada Router NDN .....                         | 25 |
| Gambar 4.11 Advertise content /ndn/shofi .....                                | 25 |
| Gambar 4.12 <i>ndnping /ndn/shofi dari Client</i> .....                       | 26 |
| Gambar 4.13 Script socket programming pada translation gateway .....          | 27 |
| Gambar 4.14 Lanjutan script socket programming pada translation gateway ..... | 28 |
| Gambar 4.15 Script socket programming pada translation gateway .....          | 29 |
| Gambar 4.16 Client menerima content testing00 .....                           | 29 |
| Gambar 4.17 Received request content pada server .....                        | 30 |
| Gambar 4.18 Isi NDN log pada server NDN .....                                 | 30 |
| Gambar 4.19 Isi NFD log pada Client NDN .....                                 | 30 |
| Gambar 4.20 Translasi dari jaringan IP ke jaringan NDN .....                  | 31 |
| Gambar 4.21 Translasi dari jaringan NDN ke jaringan IP .....                  | 31 |
| Gambar 5.1 Topologi pada IP to NDN .....                                      | 32 |

|  |           |
|--|-----------|
| <b>Gambar 5.2 Mengaktifkan NFD .....</b>   | <b>33</b> |
| <b>Gambar 5.3 Mengaktifkan bash.....</b>   | <b>33</b> |
| <b>Gambar 5.4 Advertise content dan eksekusi producer.py pada Server NDN .....</b>                     | <b>33</b> |
| <b>Gambar 5.5 Eksekusi servip.py pada Translation Gateway .....</b>                                    | <b>33</b> |
| <b>Gambar 5.6 Tampilan Wireshark.....</b>  | <b>34</b> |
| <b>Gambar 5.7 Content diterima oleh Client IP .....</b>  | <b>34</b> |
| <b>Gambar 5.8 Hasil capture Wireshark .....</b>  | <b>35</b> |
| <b>Gambar 5.9 Topologi NDN to IP .....</b>   | <b>36</b> |
| <b>Gambar 5.10 Eksekusi servip.py pada Server NDN .....</b>  | <b>37</b> |
| <b>Gambar 5.11 Advertise content dan eksekusi clip.py pada server IP .....</b>                         | <b>37</b> |
| <b>Gambar 5.12 Tampilan wireshark.....</b>   | <b>37</b> |
| <b>Gambar 5.13 Tampilan wireshark.....</b>   | <b>38</b> |
| <b>Gambar 5.14 Hasil capture pada wireshark .....</b>  | <b>38</b> |
| <b>Gambar 5.15 Grafik RTT IP to NDN .....</b>  | <b>39</b> |
| <b>Gambar 5.16 Grafik inter-arrival delay IP to NDN.....</b>   | <b>40</b> |
| <b>Gambar 5.17 Grafik throughput IP to NDN.....</b>  | <b>40</b> |
| <b>Gambar 5.18 Grafik perbandingan RTT IP to IP dan IP to NDN .....</b>                                | <b>41</b> |
| <b>Gambar 5.19 Grafik perbandingan inter-arrival delay IP to IP dan IP to NDN .....</b>                | <b>41</b> |
| <b>Gambar 5.20 Grafik perbandingan throughput IP to IP dan IP to NDN .....</b>                         | <b>42</b> |
| <b>Gambar 5.21 Grafik rata-rata RTT NDN to IP.....</b>   | <b>43</b> |
| <b>Gambar 5.22 Grafik rata-rata inter-arrival delay NDN to IP .....</b>                                | <b>43</b> |
| <b>Gambar 5.23 Grafik rata-rata throughput NDN to IP .....</b>   | <b>44</b> |
| <b>Gambar 5.24 Perbandingan rata-rata RTT dari IP to IP dengan NDN to IP .....</b>                     | <b>44</b> |
| <b>Gambar 5.25 Perbandingan inter—arrival delay dari IP to IP dan NDN to IP.....</b>                   | <b>45</b> |
| <b>Gambar 5.26 Perbandingan throughput IP to IP dan NDN to IP .....</b>                                | <b>45</b> |
| <b>Gambar 5.27 Perbandingan rata-rata RTT sistem IP to NDN dan NDN to IP.....</b>                      | <b>46</b> |
| <b>Gambar 5.28 Perbandingan rata-rata inter-arrival delay sistem IP to NDN dan NDN<br/>to IP .....</b> | <b>46</b> |
| <b>Gambar 5.29 Perbandingan rata-rata throughput sistem IP to NDN dan NDN to IP<br/>.....</b>          | <b>46</b> |
| <b>Gambar 5.30 Topologi Multi-Client IP to NDN .....</b>   | <b>47</b> |
| <b>Gambar 5.31 Capture pengujian Client 1 .....</b>  | <b>48</b> |
| <b>Gambar 5.32 Capture pengujian Client 2 .....</b>  | <b>48</b> |
| <b>Gambar 5.33 Topologi Multi-client NDN to IP.....</b>  | <b>49</b> |

|  |           |
|--|-----------|
| <b>Gambar 5.34 Capture data dari Client 1.....</b>                                   | <b>50</b> |
| <b>Gambar 5.35 Capture data dari Client 2.....</b>                                   | <b>50</b> |
| <b>Gambar 5.36 Topologi Multi Server NDN to IP.....</b>                              | <b>51</b> |
| <b>Gambar 5.37 Capture pengujian dari server 2 (example/testApp2) .....</b>          | <b>51</b> |
| <b>Gambar 5.38 Capture pengujian dari server 1 (example/testApp1) .....</b>          | <b>51</b> |
| <b>Gambar 5.39 Topologi multi server IP to NDN .....</b>                             | <b>52</b> |
| <b>Gambar 5.40 Capture Pengujian 1 Client dengan 3 content dari 3 server berbeda</b> | <b>52</b> |
| <b>Gambar 5.41 Capture hasil pengujian webpage.....</b>                              | <b>53</b> |