This submission template is a convenient document for you to provide your work and your answers for Lab 6. This submission template is intended to be used in conjunction with the Lab 6 Instructions document. The instructions document illustrates how to correctly derive the answers, explains important theoretical and practical details, and contains the complete set of instructions for this lab.

Name:

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Date:

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**Section One – IPv6 Address Representation**

2. Convert the following IPv6 address given in binary to its canonical text representation shown in step 1.  
  
11010011 00000101 11111100 10101010 00000000 11000000 11100111 00111100

01010000 11000001 10000101 00001111 00100100 11011011 10100011 01100110

D305:FCAA:00C0:E73C:50C1:850F:24DB:A366

4. Now you give the rule a try on the following address:  
  
00000000 10001111 11000110 00000001 00001011 00111110 11111110 00011000  
11101110 01110000 00111001 11111110 01010100 11000001 00000001 11100111  
  
Represent the address in its canonical text notation, making sure to eliminate all leadings 0 digits as described by the rule introduced in step 3.

008F:C601:0B3E:FE18:EE70:39FE:54C1:01E7

If we apply the first rule to eliminate all leading 0 digits, the leading 0 bits are eliminated, ~~00~~8F:C601:~~0~~B3E:FE18:EE70:39FE:54C1:~~0~~1E7, and the result is thus 8F:C601:B3E:FE18:EE70:39FE:54C1:1E7.

6. Now you give this second rule a try on the following address:

11001100 01110110 00000000 00000000 00000000 00000000 00111011 11100111

00000000 00000000 00000000 00000000 00000000 00000000 11110010 10000110

Represent the address in its canonical text notation, making sure to zero compress the appropriate consecutive groups of all 0 digits, as described by the rule introduced in step 5.

CC76:0000:0000:3BE7:0000:0000:0000:F286

Zero compression: CC76:0000:0000:3BE7::F286

8. Given the following IPv6 address in binary:

00000000 00000000 00000000 00000000 00000000 00000000 00000000 10101011

00001001 00010000 00000000 00000000 11110001 01010110 00001101 01010101

determine its canonical text representation, making sure to remove leading 0 digits and to apply zero compression, as illustrated in step 7.

0000:0000:0000:00AB:0910:0000:F156:0D55

0000:0000:0000:~~00~~AB:~~0~~910:~~000~~0:F156:~~0~~D55

::AB:910:0:F156:D55

10. Imagine that a computer is assigned IPv4 address 245.19.1.99. Create its corresponding IPv4-mapped IPv6 address as demonstrated in step 9, making sure to zero compress the result.

First, we start with 80 0 bits, which corresponds to 5 groups of 4 hexadecimal digits: 0000:0000:0000:0000:0000.

Second, we append the 16 1 bits, which corresponds to 1 group of hexadecimal digits: 0000:0000:0000:0000:0000:FFFF.

Third, we append the IPv4 address:

0000:0000:0000:0000:0000:FFFF:245.19.1.99.

Fourth, we zero compress the result: ::FFFF.245.19.1.99

Your lab submission will be evaluated according to the following rubric.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Letter Grade** | **Qualities Demonstrated by the Lab Submission** | **Grade Assigned** |
| **Answers and Methodology**  **Measures the correctness and completeness of the answers and methodology used for lab steps** | A+ 🡺 100 | The answers, and answer justifications where required, are entirely complete and correct for all steps. The methodologies used to derive the answers are entirely applicable to the given problems, and are implemented correctly, for all steps. There are absolutely no technical or other errors present. |  |
| A 🡺 96 | One insignificant technical or other error is present, but otherwise the answers, and answer justifications where required, are entirely complete and correct for all steps. Excluding the insignificant error, the methodologies used to derive the answers are entirely applicable to the given problems, and are implemented correctly, for all steps. |
| A- 🡺 92 | One or two technical or other errors are present, but otherwise the answers, and answer justifications where required, are entirely complete and correct for all steps. Excluding the one or two errors, the methodologies used to derive the answers are entirely applicable to the given problems, and are implemented correctly, for all steps. |
| B+ 🡺 88 | The answers, and answer justifications where required, are complete and correct for most steps. Likewise, the methodologies used to derive the answers are applicable to the given problems, and are implemented correctly, for most steps. |
| B 🡺 85 | The answers are correct or almost correct for most steps. Some answer justifications may be missing or incorrect, but most are present and correct where required. The methodologies used to derive the answers are applicable and implemented correctly for most steps. |
| B- 🡺 82 | The answers, and answer justifications where required, are complete and correct for about ¾ of the steps. Likewise, the methodologies used to derive the answers are applicable to the given problems, and are implemented correctly, for about ¾ of the steps. |
| C+ 🡺 78 | The answers are correct or almost correct for about ¾ of the steps. Some answer justifications may be missing or incorrect. The methodologies used to derive the answers are applicable to the given problems, and are implemented correctly, for about ¾ of the steps. |
| C 🡺 75 | The answers for about half of the steps are either missing or incorrect. Likewise, the methodologies used for about half of the steps are either inapplicable to the given problem, or are implemented incorrectly. Some answer justifications are missing or incorrect where required. |
| C- 🡺 72 | The answers for most of the steps are either missing or incorrect. Likewise, the methodologies used for most of the steps are either inapplicable to the given problem, or are implemented incorrectly. Some answer justifications are missing or incorrect where required. |
| D 🡺 67 | The answers for almost all of the steps are either missing or incorrect. Likewise, the methodologies used for almost all of the steps are either inapplicable to the given problem, or are implemented incorrectly. Some answer justifications are missing or incorrect where required. |
| F 🡺 0 | The answers for virtually all of the steps are either missing or incorrect. Likewise, the methodologies used for virtually all of the steps are either inapplicable to the given problem, or are implemented incorrectly. Some or all answer justifications are missing or incorrect where required. |

Use the **Ask the Facilitators Discussion Board** if you have any questions regarding how to approach this lab.

Save your lab submission as ***lastnameFirstname\_lab6.doc*** and submit it in the *Assignments* section of the course.

For help uploading files please refer to the *Technical Support* page in the syllabus.