

Red Team Modeling Project 4: Content Checklist and Guidance

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The way your team executes your project is largely up to you, and that is the central point of the exercise. The project is the capstone completion of your optimization courses at NPS. While you are completing it, pretend that you really were given the corresponding real-world problem to analyze and the answers would have a real operational impact.

Similarly, when you give your presentation, pretend that you are really presenting to knowledgeable people in charge. The audience generally understands OR methods, but has not thought of the details of the problem as you have... and that is exactly the audience present in class.

To help you prepare your presentation, here is a checklist of items I will be looking for as I grade. This is literally a checklist I will check off during the presentation, having each one of these will be worth some percentage of the final score, though the final score will also include other considerations.

Presentation content items, and you don't have to have them in this order specifically:

- **Back-story / Problem.** In English, what is the real-world problem you are analyzing? What is the network operation? What kinds of attacks are we worried about? What are the analysis questions you will answer during your presentation?
- **How did you mathematically model the real world?** Once you have your abstract network, how did you turn the rest of the real-world problem into a mathematical formulation?
 1. **What is the network abstraction of the real-world you are using?** I will look for the following sequence of three slides:
 - (a) Real-world map.
 - (b) Overlay of real-world map and your abstract network.
 - (c) Just your abstract network, with explanation of any modeling tricks required.
 2. **What is the measure of effectiveness for the network?** How did you decide to quantify the network operations into a single real-number, and why does that make sense?
 3. **What is the operator's problem for your network?** What are the decisions the operator makes when operating your network?
 4. **How did you model attacks or design on your network?** For your particular network, what does an attack mean, and how does that influence what the operator can do? Or, what are the designs you computed and what do they mean in terms of network operation?
- **Analysis.** Tell us the interesting results of your analysis. What are the interesting things you learned? *Teach* your audience about the things you discovered.
 1. **Operator resilience curve.** There should be at least one operator resilience curve in your presentation. For network design, this could be a graph of how network performance improves with additional construction or design.

2. **Why does the operator resilience curve behave the way it does?** If there are big jumps in the operator resilience curve, why are they there? If there are no big jumps, why not? Same question for designs.
 3. **Geographic visualization of attack / design points.** You should have at least one slide, perhaps a sequence of slides that give the audience an idea about the locations of optimal attacks or designs on the network. Also, give an intuitive idea about why those locations make sense.
 4. **Open ended analysis directions...** What is special about the modeling you did for your network? What analysis directions did you consider, to make your analysis more realistic? The audience will be particularly interested in these, because they are likely to be quite unique for each team. Also, what are the results you found, and why do those results make sense?
- **Summary and Conclusion.** Give us just one slide on the limitations of your analysis. In other words, if you had 3 additional months to work on this, what else would you have done to make the results better?

Finally, there is nothing worse, from an audience perspective, than a presentation that is not on time. Time your presentation to be 21 minutes with a margin of error of 2 minutes in either direction. If you are outside of that, there will be a score penalty.

The content for the executive summary should be similar to the presentation content, just very compressed. Boil down your presentation to the key summary points that a busy decision maker needs to know. In particular, you should structure it like this:

1. Problem.
2. Results.
3. Why the results make sense. Possibly a very tiny mention of how the results were derived.

Keep the executive summary to at most 3 pages.

On Wednesday, email me a draft of your executive summary for peer review. Please 1) do not include your team names anywhere in the document or document title 2) Name the document with a 2-3 word title for your project, mixed case, no spaces 3) email me the resulting document in **pdf** format. Each of you, will in turn, receive two of these to read through and comment.