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6.033 Computer System Engineering
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Preparation for Recitation 11

Read *An Introduction to Wide-Area Internet Routing*. You may skip the appendices in these notes, and skip or skim sections 3.3 through 3.5.

Make sure you've read Section 7.4 of the textbook. For the paper, you'll specifically want a very good understanding of Section 7.4.2 (the path vector protocol).

This paper was written specifically for 6.033, so ought to go down easier than some of the research papers we've been giving you. Nonetheless, some of the standard reading tactics apply.

- Notice that the paper is full of acronyms and technical terms like "route reflectors" and "confederations." Which if any do you actually need to remember or understand in order to get the main idea of the paper? Ignore the others. For starters, you might keep an eye out for BGP, IP, AS, customer, provider, peering, transit.
- Start by reading the abstract and conclusion (section 3.6). The "take home points" may not make complete sense at first, but they will tell you what to look out for as you read the paper.
- Next go through the introduction. And take another look at 3.6: its points should make more sense now.
- Section two can be thought of as specifying the "requirements" for wide area routing: it discusses the kind of things network providers want to be able to do. This requirements discussion spills over to the beginning of Section 3 (up to but not including 3.1) and is relatively understandable.
- Sections 3.1 and on get into the details of how the requirements are met. Many of those details are less important; you might ignore them until you've had a chance to mull over the higher level issues for a while.

As you finish, consider the obvious general question:

- Why was this paper assigned? What useful information does it convey beyond that given in the text section 7.4.2?

And here are some specific ones:

- What are peering and transit relationships, and how are they different?
- Why do providers so dislike carrying other providers' packets? How does it hurt the provider to do so?
- What is a path-vector protocol? Why does the path-vector protocol in 7.4.2 look at hops over links, while BGP looks at hops through ASs?
- How much fault isolation do you get from BGP? What happens to the routing in the rest of the network, short and long term, if some router turns off? What is the worst that can happen if some router starts misbehaving (sending incorrect information)?
- Does routing have to be this complicated? Is it complex because of complex requirements, or because of bad design choices?
- Routers use the BGP protocol to set up routes by talking to each other. But they talk to each other using TCP, which relies on the presence of routes. Doesn't this create a chicken and egg problem?