Chapter 8. Production-Grade Terraform Code

Building production-grade infrastructure is difficult. And stressful. And time consuming. By *production-grade infrastructure*, I mean the kind of infrastructure you'd bet your company on. You're betting that your infrastructure won't fall over if traffic goes up, or lose your data if there's an outage, or allow that data to be compromised when hackers try to break in—and if that bet doesn't work out, your company might go out of business. That's what's at stake when I refer to production-grade infrastructure in this chapter.

I've had the opportunity to work with hundreds of companies, and based on all of these experiences, here's roughly how long you should expect your next production-grade infrastructure project to take:

- If you want to deploy a service fully managed by a third party, such as running MySQL using the AWS Relational Database Service (RDS), you can expect it to take you one to two weeks to get that service ready for production.
- If you want to run your own stateless distributed app, such as a cluster of Node.js apps that don't store any data locally (e.g., they store all their data in RDS) running on top of an AWS Auto Scaling Group (ASG), that will take roughly twice as long, or about two to four weeks to get ready for production.
- If you want to run your own stateful distributed app, such as an Elasticsearch cluster that runs on top of an ASG and stores data on local disks, that will be another order-of-magnitude increase, or about two to four months to get ready for production.

- If you want to build out your entire architecture, including all of your apps, data stores, load balancers, monitoring, alerting, security, and so on, that's another order-of-magnitude (or two) increase, or about 6 to 36 months of work, with small companies typically being closer to six months and larger companies typically taking several years.

Table 8-1 shows a summary of this data.

Table 8-1. How long it takes to build production-grade infrastructure from scratch

Type of infrastructure	Example	Time estimate
Managed service	Amazon RDS	1–2 weeks
Self-managed distributed system (stateless)	A cluster of Node.js apps in an ASG	2–4 weeks
Self-managed distributed system (stateful)	Elasticsearch cluster	2–4 months
Entire architecture	Apps, data stores, load balancers, monitoring, etc.	6–36 months

If you haven't gone through the process of building out production-grade infrastructure, you may be surprised by these numbers. I often hear reactions like, "How can it possibly take that long?" or "I can deploy a server on <cloud> in a few minutes. Surely it can't take months to get the rest done!" And all too often, from many an overconfident engineer, "I'm sure those numbers apply to other people, but *I* will be able to get this done in a few days."

And yet, anyone who has gone through a major cloud migration or assembled a brand-new infrastructure from scratch knows that these numbers, if anything, are optimistic—a best-case scenario, really. If you don't have people on your team with deep expertise in building production-grade infrastructure, or if your team is being pulled in a dozen different