13.5: APPLICATION PROGRAMMING INTERFACES

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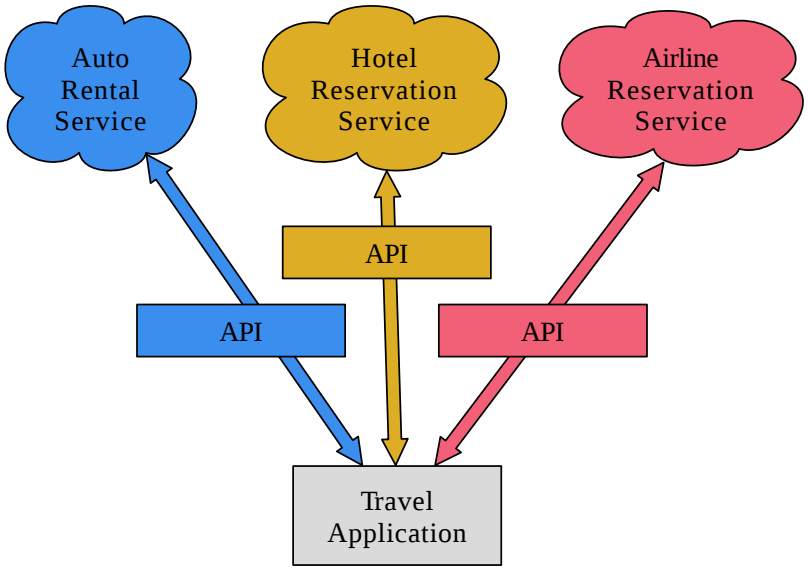
We now have the ability to exchange data between applications using HyperText Transport Protocol (HTTP) and a way to represent complex data that we are sending back and forth between these applications using eXtensible Markup Language (XML) or JavaScript Object Notation (JSON).

The next step is to begin to define and document "contracts" between applications using these techniques. The general name for these application-to-application contracts is *Application Program Interfaces* or APIs. When we use an API, generally one program makes a set of *services* available for use by other applications and publishes the APIs (i.e., the "rules") that must be followed to access the services provided by the program.

When we begin to build our programs where the functionality of our program includes access to services provided by other programs, we call the approach a *Service-Oriented Architecture* or SOA. A SOA approach is one where our overall application makes use of the services of other applications. A non-SOA approach is where the application is a single standalone application which contains all of the code necessary to implement the application.

We see many examples of SOA when we use the web. We can go to a single web site and book air travel, hotels, and automobiles all from a single site. The data for hotels is not stored on the airline computers. Instead, the airline computers contact the services on the hotel computers and retrieve the hotel data and present it to the user. When the user agrees to make a hotel reservation using the airline site, the airline site uses another web service on the hotel systems to actually make the reservation. And when it comes time to charge your credit card for the whole transaction, still other computers become involved in the process.



Service Oriented Architecture

A Service-Oriented Architecture has many advantages including: (1) we always maintain only one copy of data (this is particularly important for things like hotel reservations where we do not want to over-commit) and (2) the owners of the data can set the rules about the use of their data. With these advantages, an SOA system must be carefully designed to have good performance and meet the user's needs.

When an application makes a set of services in its API available over the web, we call these *web services*.