CS 240 Computer Systems

#16: Services and Microservices

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Web Service Architecture

When designing a complex system, there are many different server architectures for a system:

[Monolithic Architecture]:

[Microservice Architecture]:

Monolithic Architecture	Microservices Architecture

Who Uses Microservices?

Configuration and Deployment Challenges
One of the most challenging bits of microservices is managing the configuration and deployment of the microservices:

- What is the location of my dependencies?
- How do I quickly update the configuration?

Solution: _____
Every process on every Operating System runs with a number of **environmental variables**.

Command to List All Environment Variables	
Linux:	`env`
Windows PowerShell:	`dir env:`

A few common ones:

- PATH
- HOME (or HOMEPATH)
- USER (or USERNAME):

A few commonly defined in development environments:

- ENV:
- DEBUG:
- ...any number of custom application-specific ones...

Common Programming Convention: .env Files
A common, but not built-in, programming convention is to use .env files to specify deployment-specific environment variables.

16-services/.env

```
FLASK_RUN_PORT = 24000
```

...now, when we run Flask, we see it starts on a different port:

```
$ python3 -m flask run
[...]
 * Running on http://127.0.0.1:24024/ (Press CTRL+C to
quit)
```

Networking Ports
Ports provide an application-specific connection allowing multiple services to run simultaneously on a single host.

Port Range:

Common Ports:

Reserved Ports:

Unreserved Ports: