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DEVOPS

- On the system engineering team at clearwater
- **What is DevOps**
  - Development Operations
    - Some say it's tools, culture, or philosophy.
    - Process that emphasises communication. (see Wikipedia for definition)
- **Culture Conflict**
  - Developers want change [think Montagues]
  - Operations wants stability [think Capulets]
  - Old rivalry, DevOps is like mediator [think the love between Romeo and Juliette]
- **DevOps tool chain**
  - Planning
    - DevOps and Developers get together and figure out what the change is.
    - Plan what is needed, who the audience is, and the requirements for project.
  - Create
    - This is the Developer's job
  - Verify
    - Verify that the requirements are met
  - Package it up
    - Getting the app packaged into something that can be easily deployed.
  - Release
    - Getting the app out so that it's useable
    - Release tends to happen in stages
      - Testing
      - Staging
      - Production (users are here)
  - Configuration
    - Tied heavily to release.
  - Monitoring
    - Monitoring of the app/host that the app is on
      - The goal is to be aware when something goes wrong
    - Host stuff is DevOps's Bread and Butter
      - In order to properly monitor, need to PLAN how to do that.
  - REPEAT
- **Developer Highlights**
  - RAM
    - Reliability, Availability, and Maintainability
      - These are what we want.
      - Want to promote change, but make sure that it's RAM.
      - DevOps look for this when promoting a new app
  - HA
    - High Availability
      - How much the app is up (uptime) but also how useable.
      - Could be up but the customer doesn't see it
      - Want customers to be able to access AND use app
    - Five nines
      - 99.999%
      - extremely difficult to hit
      - downtime is 5.26 minutes per year.
    - RED FLAGS
      - SPoF
        - Single Point of Failure
      - System Bottlenecks
        - User unable to use system.
        - User should be your bottleneck
    - Load Balancing
      - Multiple hosts
      - Load Balancer
        - Point of failure point
        - Have 2 load balancers
          - One active
          - One passive

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        - Two load balancers that know each other's health.
            - Load balancer with the healthy state gets the IP address
    - HA- Additional layers
        - Clusters for days.
        - Hypervisor layer (ESXi, Xen, VMWare)
        - Routing/Switching
        - Data Center
        - Region
    - Want it to be present in two locations
    - Downsides of HA
        - Increases Complexity
        - More Resources
        - Higher Cost
        - User session management
            - When you switch over, users might lose data (ie need to log back in)
            - Higher HA needs to be more aware of this.
    - Prioritise your HA. Internal might not need as much HA for example.
- Cattle vs Pets
    - It's easy to treat our servers like pets
    - DevOps treat servers like cattle
    - Configuration Management is what allows DevOps to treat servers like cattle
        - Making sure new thing is identical to the old thing
        - Ensures that the current design and build state of the system is known, good, & trusted; and doesn't rely on the tacit knowledge of the Development team
            - *[Insert some services that do this]*
            - Anisble is good for small config management
            - Puppet used by Clearwater
- Microservies
    - In the past, it was easier to make HUGE applications because you had baremetal servers.
        - Made it difficult to find failures
    - Build lots of little apps that communicate with each other.
        - Makes it easier to identify when things go kaput.
        - Limits scope.
            - Only have to worry about my piece.
        - Made feasible by virtualisation.
            - Virtualisation is software based hardware.
            - Uses a hypervisor.
                - Simulates the hardware of another operating system.
                - Helps if you want to test different configurations, but don't want to configure your computer every time
                - Vagrant.up = local virtualisation
- Containers [**BIG** in the industry. **HOT HOT HOT**]
    - New way of thinking about things with virtualisation
    - Instead of having a whole OS on your virtual machine, have little packages.
    - Lightweight, stand-alone, executable package of a piece of software that includes everything you need to run.
    - Newer, better, less resource intensive.
    - Can share libraries and configurations.
    - Can run containers locally
    - Orchestrators are managers of containers [look it up if you're interested.]
- Monitoring
    - Why? It's not helping the app.
        - Catch problems before the end users do.
    - Host (things to monitor) [DevOps Team Ownership]
        - Disk
        - RAM
        - CPU
        - Load
            - General metric for how busy the network is
        - Temperature
        - etc…

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- Services [DevOps and Developers Co-Ownership]
  - Status
    - Check the status of the app AND what it is dependent on.
  - Dependency Status
    - See the status of app's dependency
  - Response Time
    - Why does the response time change? Things like that.
- If interested in DevOps read:
  - The Phoenix Project
    - Fiction but good
    - Good to see from DevOps point of view
  - The DevOps Handbook
    - Less exciting, but if you're into it.

Q&A
- Q: Tooling and DevOps
  - It's a way of facilitating developers to make sure they get what they need to get done.
  - DevOps is herding devoloper-cats.
- Q:What are your specific focuses?
  - Focuses on Configuration
  - Puppet configurations
  - Maintain the configuration management.
  - Another half of team focuses on tools.
- Q: How do you apply cattle vs pets to configuration management?
  - *//I don't understand the answer.*
  - Puppet configuration is kind of like his pet
  - PXEboot
    - configuration is in the boot up process of the server.
- Q: The box?
  - = Host or Node
    - virtualised host that is running the application.
  - Not referred to baremetal anymore because of virtualisation
  - Everything that's a host is also a box.

[Nilab is mean here]
- Q: What do you use in your DevOps
  - use uBuntu. Python backend.
  - Angular or Polymer as front end.
- Q: How many virtual servers can be on a real server?
  - Depends on the server.
  - Also depends on the size of the virtual machine.
  - With virtualised machine, you get a reduced rate of return.
  - If you have an app that need a TON of CPU power, virtualisation may not be the way to go.
- Q: How do you like digital watch
  - Moto 360
  - He likes it.
- Q: How long have you been there
  - Been at clearwater
- Q: How many system engineers at clearwater
  - 8 or 9 people on system engineering team
  - Have 3 data centres.