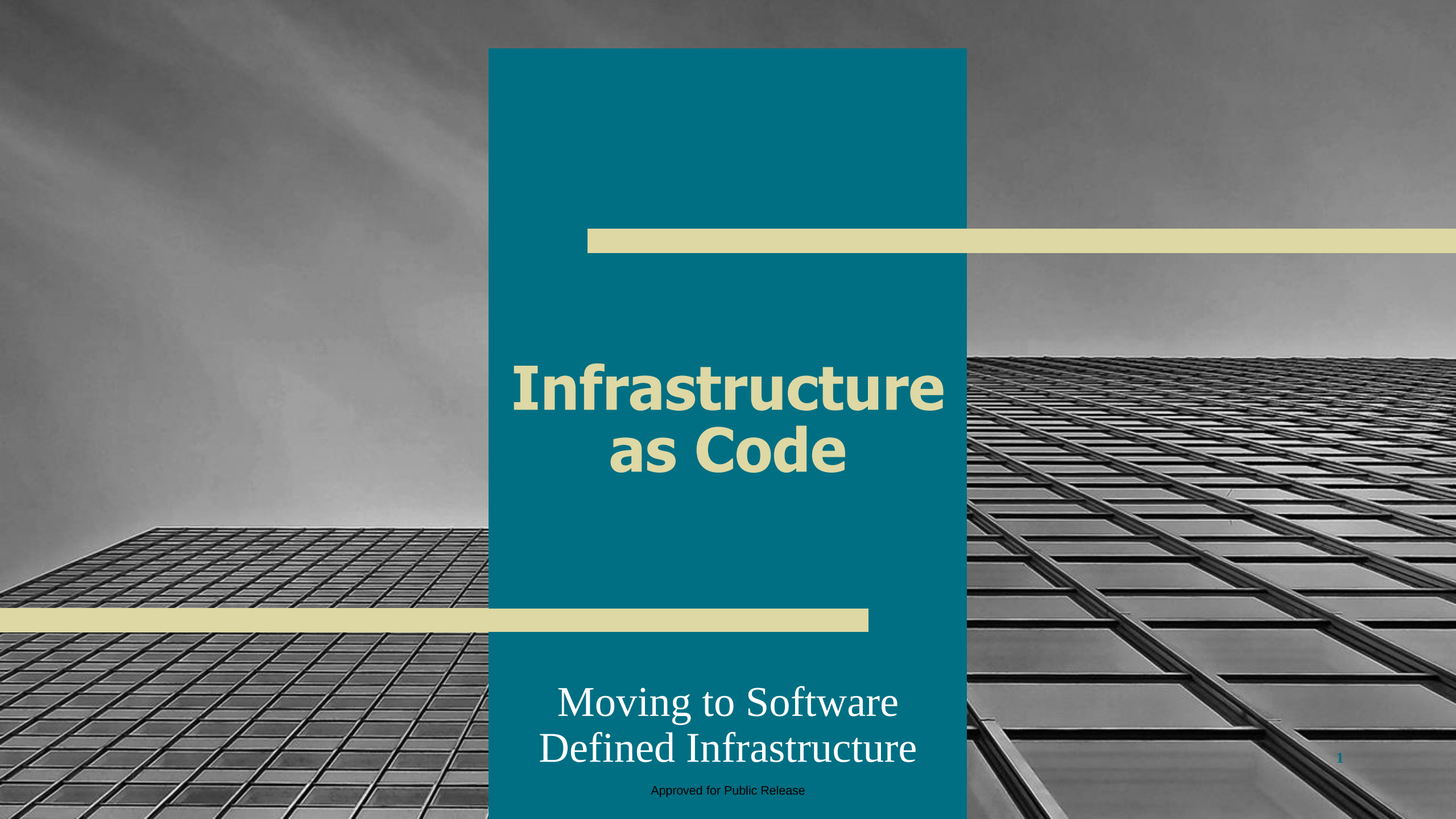


Infrastructure as Code

Moving to Software Defined Infrastructure

Approved for Public Release

"Software is Eating the World"

Marc Andreessen

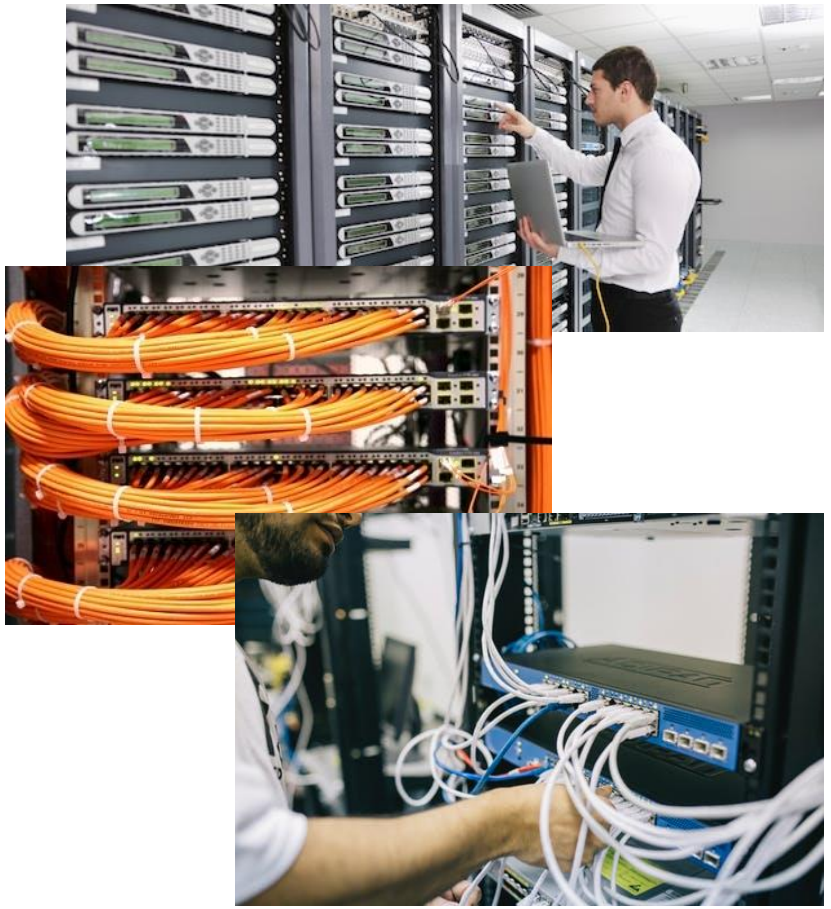
Vision

- Information Technology must change at the speed of Software to meet the current and future demands of the defense industry
  - The defense industry is increasingly dissatisfied with traditional acquisition methods for systems and services that require years in development and test. They are looking at methodologies like DevOps for a more tactical acquisition of products and services with shorter cycle times, faster integration & delivery, frequent enhancements, and dynamic & responsive product/service sustainment to combat the ever-changing cyber security threat

IT Must Evolve to Meet the Challenges of Tomorrow

The Problem

- Traditional infrastructure and IT, where the focus is on hardware (servers, network, storage, power, cooling), is not able keep up with dynamic nature of development methodologies like DevOps
  - Too dependent on homogenous computing hardware
  - Too limited by network hardware
  - Too reliant on storage hardware
  - Hardware inefficiencies scale with the size of the system
  - Complex Dependencies (people, facilities, hardware, software)
  - SLOW to change
  - STATIC in configuration



The Speed of Software

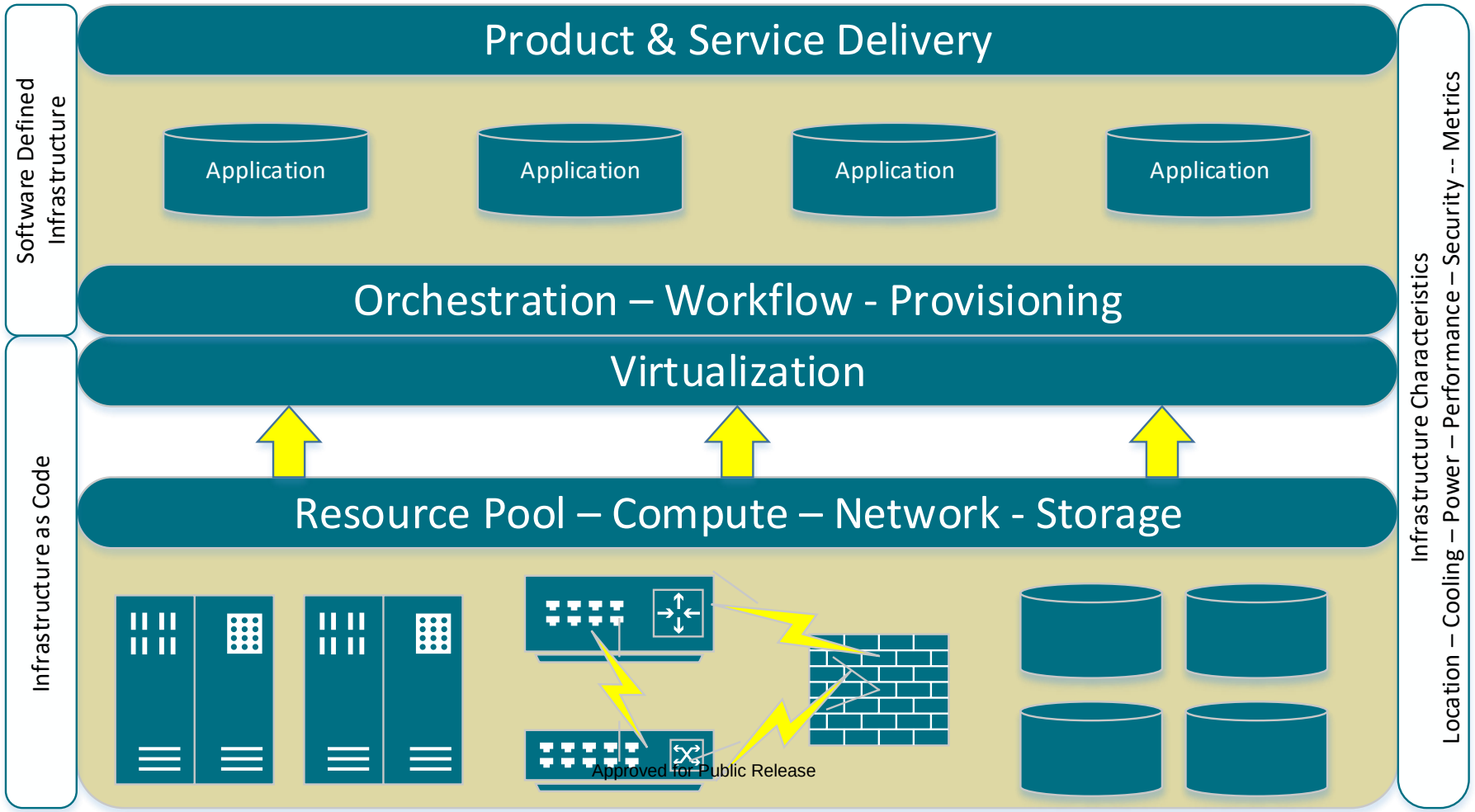
- Abstracting out the reliance on physical hardware (Infrastructure as Code) and reducing or eliminating the need for the human-in-the-loop intervention (Software Defined Infrastructure) for development, operations, and sustainment will enable infrastructure to perform at the speed of software
  - Automation capabilities and tools to react to real time operational needs
  - Automated deployment to provision computing, network, and storage on the fly
  - Build & Destroy at the drop of a hat to meet your development, operations, or sustainment needs
    - FAST to change
    - DYNAMIC in configuration
    - Supports DevOps, Agile, & Cloud needs
  - Get humans out-of-the-loop for repetitive and error prone tasks
  - Achieve scalability on demand

Definitions

- **Infrastructure as Code (IaC)** is the process of managing and provisioning computer data centers through machine-readable definition files, rather than physical hardware configuration or interactive configuration tools.
  - Wikipedia (https://en.wikipedia.org/wiki/Infrastructure_as_Code)

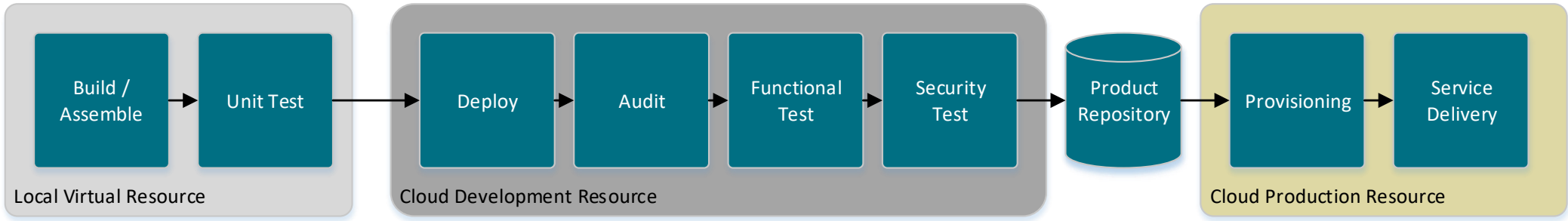
- **Software Defined Infrastructure (SDI)** is the definition of technical computing infrastructure entirely under the control of software with no operator or human intervention. It operates independent of any hardware-specific dependencies and is programmatically extensible.
  - Wikipedia (https://en.wikipedia.org/wiki/Software-defined_infrastructure)

Logical IaC & SDI

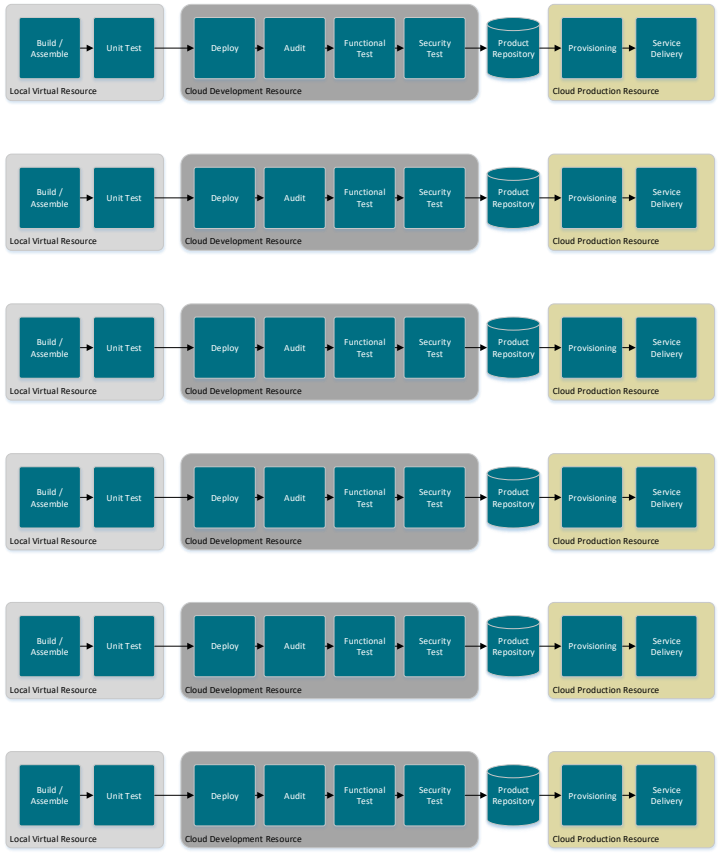


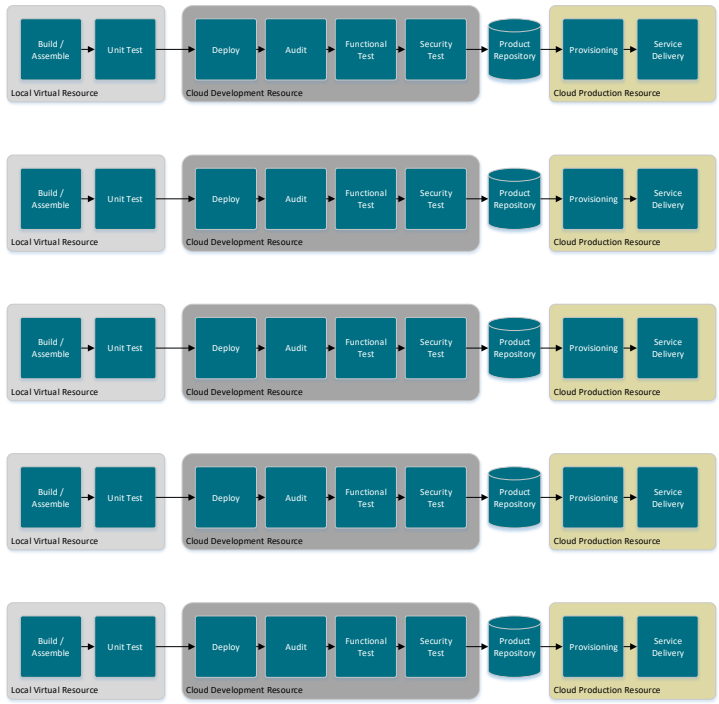
DevOps Example

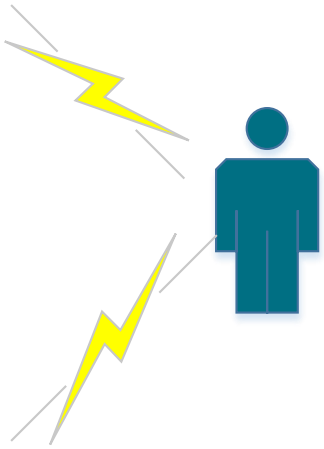
- Use the power of IaC and SDI to quickly be able to deploy a DevOps pipeline
  - From software developer virtual desktop → test and checkout → production
    - Build the DevOps pipeline when you need it → Destroy it when done
    - Automate the provisioning, deployment, test, and delivery



DevOps Explosion







SUMMARY

Traditional approach to IT Infrastructure does not support the future of the warfighter and defense industry. Infrastructure must evolve to meet the needs of the future

- Shorter Cycle Times
- Faster Integration & Delivery
- Frequent Enhancements
- Dynamic & Responsive Sustainment