# Dynamic Infrastructure

Two Census Examples

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# Dynamic Infrastructure

The key to a business and IT infrastructure that is "dynamic" is leveraging technologies, service delivery and acquisition models that optimize the infrastructure for efficiency and flexibility. By design, every dynamic infrastructure is service-oriented and focused on supporting and enabling the end users in a highly responsive way, and allows for:

- Enhanced performance
- Scalability and elasticity
- System availability and uptime
- Visibility, control, and automation across all business and IT assets.
- Managing and mitigating risks.
- Utilization of alternative sourcing approaches (i.e. clouds, external service providers, etc.)

# Census and Dynamic Infrastructure

The Centurion/Cloud and iCADE/Service Provider Census examples demonstrate how a Dynamic Infrastructure allows the Census to:

- **Provide** a breakthrough service delivery approach that can enable the Bureau to reduce costs, improve service to the end users and better manage risk.
- **Leverage** technologies, service delivery and acquisition models that optimize the infrastructure for efficiency and flexibility.
- **Enable** innovation and change instead of constraining it.

The examples show how non-functional needs like enhanced performance and disaster recovery can be addressed with two distinct examples, respectively.

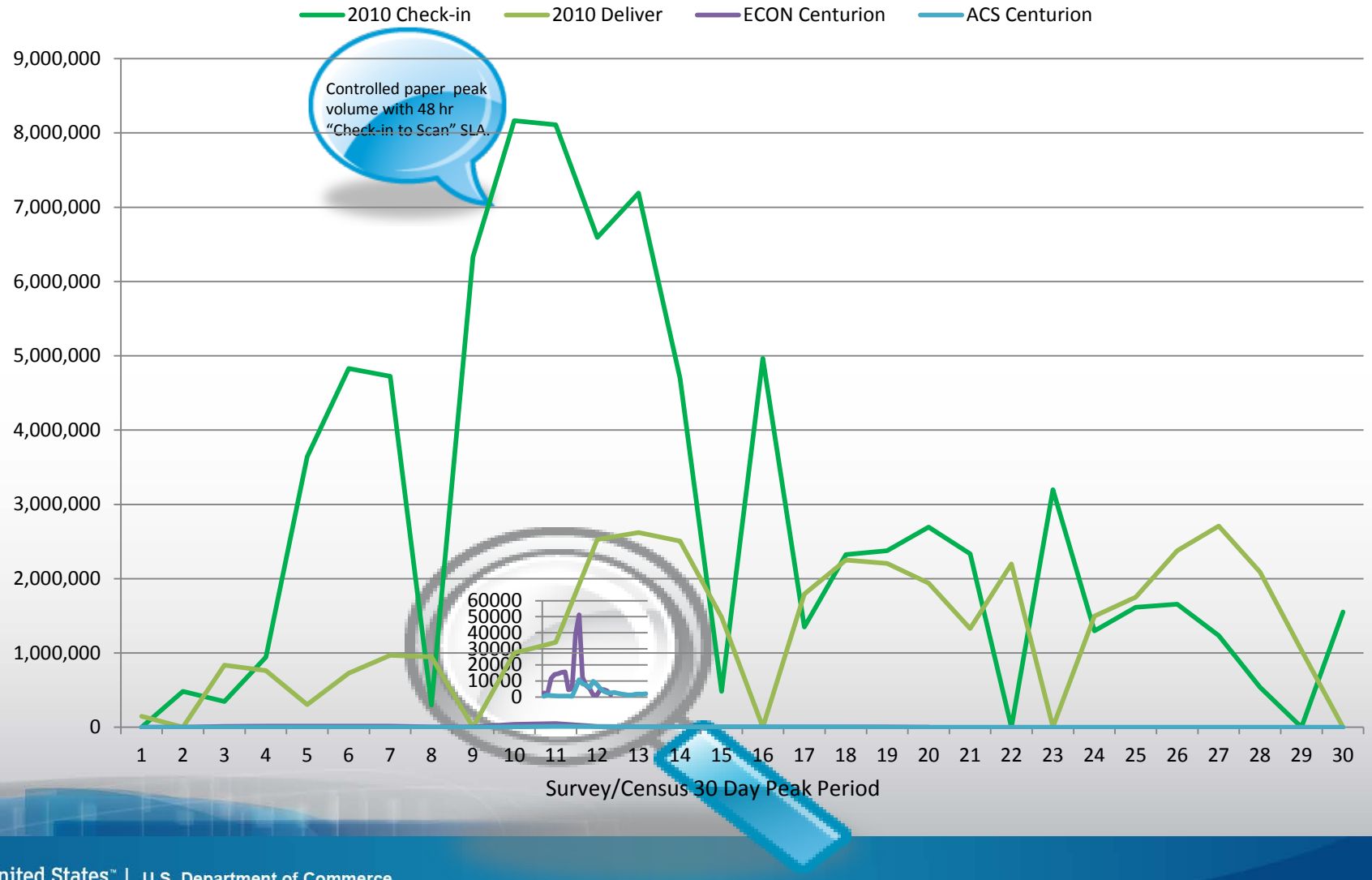
# Centurion/Cloud Example

Functional Requirement:  Self response internet capabilities for 2020 Census.

Performance Requirement:  Possible peak load of 8 million respondents per day within a 30 day period.

Problem Statement:  The volumes needed to process the 2020 Decennial peak versus ACS and ECON Census (largest volumes outside Decennial) have the potential to be over 100 times greater.  However, volume processing capability is needed for approximately a 30-60 day period every 10 years.

# Peak Daily Volume Comparison



# Centurion/Cloud Example

Options:

1. Outsource overall internet processing to 3rd party vendor
2. Build out current Centurion infrastructure to meet processing needs
3. **Place in-house Centurion application into a cloud environment** *

Option 3: Centurion is the Census internet response data collection system, a mature standard web application architecture used for ECON Census, American Community Survey (ACS), and over 40 current surveys. Plus used outside of Census for ….

Centurion is built upon a portable framework which allows the Census to implement an instance of the Centurion framework and database tier onto any amenable hardware infrastructure. There are FedRamp approved cloud providers who have designed dynamic hardware specifically for service consumers who want to increase an applications scalability and elasticity capabilities to meet unknown and/or unusual high processing demands.

*This document is not choosing a particular option, it is showing how one particular option can be deployed to solve a problem by taking advantage of the characteristics of a "Dynamic Infrastructure". Policy and security concerns exist for any option that does not house all processing within the physical confines of the Census Bureau.

# iCADE/Service Provider Use Case

Functional Requirement:  Self response paper capabilities for 2020 Census.

Disaster Recovery (DR) Requirement: Following a disruption (i.e. natural disaster) to the original site a DR site exists to allow for relocation of paper processing with agreed upon losses to normal operations.

Problem Statement:  The capacity of the DR site may or may not match the capacity of the original site depending on the requirements.  Other key considerations when determining a DR site relate to the “Geographical disbursement question” and a risk assessment would need to be performed to include consideration of geographical location, physical location, labor force availability, central point of mail delivery, etc.

# iCADE/Service Provider Use Case

Options:

1. Outsource overall paper-base processing to 3rd party vendor
2. Build out a second iCADE processing center
3. **Contract with external service provider to provide DR solution for iCADE***

Option 3: iCADE, the Census paper response data collection system is a mature operation used internally for multiple current surveys. Plus used outside of Census for ….

The iCADE framework is based on standard paper-processing hardware. There are service providers specifically in the paper-data capture segment of the market who are built upon a cloud framework which supports back-up and recovery, with geographically disbursed data centers. iCADE can contract its DR capability to one of these providers and allows for the flexibility for them to have a "hot", "cold", or "warm" DR posture. Also, a cloud-based DR infrastructure mitigates dependency to physical office space because telephone system, network infrastructure and workspace would be part of a hosted environment. This addresses the risk associated with geographical location and physical location; and provides the flexibility to establish some degree of virtual workspace for Census employees and/or a service agreement that includes temporary labor force dependent upon Recovery Time Objectives.

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# Panel Questions

1. Due to recent government data breaches and security concerns in general which have cause agencies to be more risk-averse, what is your view of the use of cloud computing in the federal agencies and what pitfalls would you recommend an agency look out for?

2. Which scenario do you see as having a higher risk proposition considering the fact of a high variance in our possible peak processing workload rate: Scenario One - Deploying a proven and mature in-house web application onto a proven internet cloud provider environment, or, Scenario Two - Deploying a newly developed web application by proven third party vendor onto a proven internet cloud provider environment?

3. Are there other use case scenarios relating to cloud and/or external service provider options we should be exploring?

# THE END