Taking Ownership of IT Infrastructure Through Open Source Technology (OST)

# Background

The National Geospatial-Intelligence Agency (NGA) depends upon a very large and steadily growing array of technologies – hardware, software, and complex information systems – to discover, collect, store, manage, process, and deliver raw data, intermediate products, finished intelligence, and related value-added services for customers, partners, and other national security stakeholders. This infrastructure currently consumes a significant portion of NGA’s annual budget to develop and maintain, a cost which continues to grow. While infrastructure costs continue to increase, the Government at large is facing future budgets cuts. If current trends continue, the costs to maintain the enterprise will exceed even the most liberal resource projections. Therefore, we need to reduce expenditures in order to execute the vision for on-line, on-demand access to all GEOINT and a fresh transformation of the analysis process. It is clear today to the senior leadership that a significant comprehensive change is urgently required.

# What Will Change?

In response to this overwhelming burden NGA is initiating a series of evaluations, pilots, and managed implementations to begin shifting the IT infrastructure away from our current heavy reliance on commercial (proprietary) software. We will adopt no-cost/low-cost open source applications and software solutions to replace costly commercial products. We will rapidly explore external technical advances, induct the best-in-class solutions, and then innovate on them internally to create unique new capabilities, without degrading the functionality, productivity, or mission effectiveness of current systems. We will adapt and evolve processes, policies, and procedures in order to keep pace with emerging open source solutions, including advanced internet-based applications, cloud computing and storage alternatives, databases, virtualization, infrastructure outsourcing, distributed collaboration and development, an increasingly rich menu of social networking technologies, and other innovations that we currently cannot exploit or absorb within the current IT environment.

This shift toward open source technology creates several advantages:

* As an institution, we can reduce our total cost to own and operate the vast technology infrastructure, which in turn allows us to redirect resources toward critical mission areas;
* For our mission partners and customers (capability users) we will be able to respond more quickly, more effectively, and with greater agility to leverage and exploit mission successes in an environment of continuous rapid change in operational intelligence demands;
* For our internal technical staff (capability developers) we will be able to take ownership of our software applications, tailor and customize them in response to unique operational needs, and employ automated development tools to track progress, configure baselines, and automate the testing and delivery process, enabling a whole new generation of powerful GEOINT tools;
* As a result of this change, we will accelerate the pace of innovation, while reducing our dependence on commercial vendors and external system integrators and the risks associated with commercial software licenses.

# Why is this Good for NGA?

It is critically important for NGA to establish an effective and efficient capability to adopt open source technology solutions. Recent innovation and commercial investment in geospatial technology and related industries has made an extensive catalog of next-generation applications, devices, widgets, and tools available to the public, and has catalyzed intense demand from intelligence, military, law enforcement, government and academic institutions for data, products, and services. NGA must be able to respond expediently and effectively to this demand by adapting the current menu – and offering compelling new choices – of tools, data, and services, in order to provide customers with valued products across a growing list of new platforms.

Despite the technical challenges inherent in transforming our IT infrastructure, we have equally substantive opportunities to transform related business practices and thereby significantly reduce the costs of maintaining it. The evolution of open source software has helped transform information technology into a commodity. Robust open source functionality exists for most areas of interest. The rise of open standards allows modular capabilities to be quickly assembled into complex solutions at dramatically reduced life cycle costs. Additionally, many enterprise functions can be outsourced, allowing more resources to be directed toward mission innovation.

Within the current IT architecture and acquisition regime, NGA is prevented from capitalizing on these opportunities. The constraints are primarily:

* Financial: Current resource projections do not permit transformation to an architecture which would support significant innovation, exploration, and exploitation of emerging candidate technologies – in order to fund the future of NGA, we must reduce the costs of today’s infrastructure.
* Technical: Traditional commercial software development often requires multiple years and several generations of software before a product is considered mature and operationally viable – in order to respond to emerging threats and exploit dynamic opportunities, we must reduce the time required to identify, select, implement, tailor, and deploy technology products.
* Operational: Continued reliance on slowly-evolving commercial technologies, at a time when our adversaries can improvise, adapt, and place new capabilities into operation in near-real time, places NGA, and more importantly, our operational military partners, at significantly increased risk – in order to match and exceed the pace of tactical operations, we must expedite the effective delivery of relevant capabilities to the point of the spear.

# What Happens if We Don’t Change?

What’s wrong with the way things are?

* We cannot reasonably expect to make any meaningful progress toward the Director’s vision, because we cannot afford anything other than the O&M on our existing IT enterprise.
* We cannot offer our customers the new products and services they legitimately expect from us.
* We cannot harvest emerging technologies from open source development communities; instead, we remain shackled to a network of private commercial vendors whose priorities and plans are not necessarily driven by our national security mission needs.
* The longer we try to maintain the current system, the more difficult, costly, and potentially risky the eventual change will be.
* Simply stated, we cannot afford to continue with business as usual.

# What is NOT Changing?

Security – Adoption of open source technology must be carefully managed in order to maintain the integrity of the enterprise, protect mission-critical data and information, and meet our mutual obligations with other intelligence community and national security mission partners.

Operational Commitment – Adoption of open source technology must result in greater capability for NGA to meet current and future mission requirements, through bold innovation, informed selection, skillful implementation, and dedicated sustainment of new technology solutions.

Technical Excellence – Adoption of open source technology must reflect and further advance the long tradition of technological, operational, and programmatic excellence which are hallmarks of NGAs service in the defense and security of the United States.

# How Does this Affect Me?

NGA (Innovision) will lead an open and collaborative effort with several key components:

* We will invite our commercial and industrial partners to work with us to discover new business models which support both NGA's technology needs and private sector economic needs;
* We will welcome participation from other government agencies and open source based businesses to identify potential enterprise infrastructure which could be outsourced, and to help us target and prototype functional areas for open source alternatives;
* We will encourage all of our partners – commercial, industrial, academic, government, member organizations within USGIF, and individual technology developers and advisors – to offer best practices, lessons learned, ideas and expertise, and other insights to help us transform the way we acquire and manage technology;
* We will educate the global open source technology community and invite them to participate;
* We will challenge these development communities to help us establish and populate an unclassified environment to explore, develop, test, validate, and verify candidate open source technology solutions prior to their entry into the NGA Enterprise;
* We will work with the NGA Enterprise owners and users to ensure open source technology solutions meet their needs.
* We will work with other stakeholders, such as to apply good ideas, expertise, and practices, and support this opportunity throughout the transition.

What are the benefits/advantages of adopting this change?

* Reduced total cost
* Increased quality and reliability
* Increased security
* Increased flexibility to tailor or customize to meet our requirements
* Simpler, more user-friendly interfaces
* More network-friendly
* Greater interoperability
* Significantly easier/simpler license management
* Greatly reduced dependence on commercial vendors
* Competition and transparency drive increased quality