

Moving to a Standard Country Code in the Department of Defense

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Problem Statement

The Department of Defense has in active use approximately 12 different standards across multiple business lines by which it assigns codes for the representation of names of countries and their subdivisions. The use of multiple standards limits system interoperability and negatively impacts data integrity and interpretability of the codes, limits transparency, and causes rework and confusion. Multiple standards also goes against various policies and directives both within the Department (such as Net-centricity) and across the federal government (such as the OMB policy to adopt voluntary consensus standards).

Background

The Department wishes to move to a single country code standard to address the issues above. The Defense Procurement and Acquisition Policy office conducted a survey to determine the as-is environment, that is, which codes were being actively used in DoD, and determined that there are three that are most widely used: FIPS 10-4, ISO 3166 (both two- and three-character versions), and NATO Standardization Agreement 1059 (STANAG-1059, three-character) codes. In addition, there are several local/homegrown standards in use in specific business applications.

This paper lays out the business case for eventually moving to the ISO 3166-1 alpha trigraph standard with an initial interim period that mandates transition to ISO 3166-1 digraph.

Discussion

Using FIPS

The FIPS 10-4 standard is widely used throughout the Department, particularly in financial management application. Federal policy on the standard could have been interpreted to mean that DoD was in fact required to use FIPS over any other code. However, this standard was withdrawn by the National Institute for Standards and Technology on September 2, 2008, in favor of using the ISO 3166-1 voluntary consensus standard, and the related policy is hence void. FIPS 10-4 is set to be retired in the Defense Information Technology Standards Registry (DISR) on December 31, 2012. As the standard is now defunct, it is not a viable alternative for a DoD voluntary consensus standard.

Using ISO

ISO 3166 standard is managed by the International Organization for Standardization. Several of the home grown country code standards are wholly or partially based on ISO,

such as the “NATO Standardization Agreement – STANAG – codes, GEO codes, and others”.

The National Geospatial-Intelligence Agency (NGA), which works closely with the Boards appointed by Congress to define and manage geographic naming, has recommended the ISO 3166-1 as the preferred standard. NSA is also actively working to move to this standard.

ISO is a mandated Defense IT Standards Registry (DISR) standard (that is to say DISR has a “sunset” flag on the FIPS and directs agencies to use ISO instead).

ISO: Two vs. Three Characters?

While the alpha-2 code is the most widely used, DPAP felt there were benefits to using the alpha-3 trigraph codes.

- Trigraph and digraph were introduced at the same time (1974) so they are equally well-known/available.
- Trigraph was mandated for use in Security Classification Marking Instructions by USD(I) in 2004.
- Trigraph owns nearly a 91% one-to-one match between with current STANAG-1059 trigraph codes.
- Digraph only owns a mere 36% one-to-one match between the next most frequently used digraph code standard, FIPS 10-4, requiring an increased focus on translation capabilities.
- No cost for two character ISO codes, while three character ISO codes must be purchased.

Benefits of a three-character code

- ISO 3166 FAQ’s note that the trigraph codes allow a better visual association between the codes and the country names than the two-letter alpha-2 codes. Considered easier to read by humans.
- They are less likely to be confused with the two-letter state abbreviations (the following duplications currently exist)

ISO 3166-1 code (2-char)	Country (ISO)	State (USPS)
AL	Albania	Alabama
AZ	Azerbaijan	Arizona
CA	Canada	California
CO	Colombia	Colorado
DE	Germany	Delaware
GA	Gabon	Georgia
ID	Indonesia	Idaho
IL	Israel	Illinois
IN	India	Indiana
KY	Cayman Islands	Kentucky

LA	Lao People's Democratic Republic	Louisiana
ME	Montenegro	Maine
MD	Moldova, Republic of	Maryland
MA	Morocco	Massachusetts
MN	Mongolia	Minnesota
MS	Montserrat	Mississippi
MO	Macao	Missouri
MT	Malta	Montana
NE	Niger	Nebraska
NC	New Caledonia	North Carolina
PA	Panama	Pennsylvania
SC	Seychelles	South Carolina
SD	Sudan	South Dakota
TN	Tunisia	Tennessee
VA	Holy See (Vatican City State)	Virginia

- There are more potential variations for future country names. Two character codes have a maximum of 676 combinations, and there is hence a higher degree of likelihood that the combination that most closely resembles the country name may already be taken, and therefore be ambiguous. Trigraph offers 17,576 combinations (less some for the reserved codes as noted below), providing a greater degree of confidence that the three characters that most closely resemble the country name are not taken.
- ISO two-character has a higher degree of overlap with the FIPS 10-4 two character code, but they are not always consistent (approximately 28% of the FIPS 10-4 codes can be cross-walked to another ISO two-character country code not of its own, with approximately only 36% actually creating a one-to-one match), leading to potential confusion (for example, AO is Angola in both FIPS and ISO two-char, but AG is Algeria in FIPS and Antigua and Barbuda in ISO). Use of the three-character code removes this confusion.

Country	FIPS Code	ISO Code	Match?
Afghanistan	AF	AF	Yes
Albania	AL	AL	Yes
Algeria	AG	DS	No
American Samoa	AQ	AS	No
Andorra	AN	AD	No
Angola	AO	AO	Yes
Anguilla	AV	AI	No
Antarctica	AY	AQ	No
Antigua and Barbuda	AC	AG	No

And so forth, a non-exhaustive review of this list shows approximately 36% of FIPS 10-4 codes have no match whatsoever, to any ISO two-character therefore, the two standards cannot be based on the same codes.

On the other hand, a non-exhaustive comparison between the ISO three-character and STANAG-1059, shows that nearly 91% of the ISO codes owned a one-to-one match with STANAG-1059. As noted in a briefing provided by NGA, ISO three-character alpha is the internationally preferred standard which correlates most closely with the NATO STANAG-1059 codes and would better facilitate interoperability on an international platform for DoD. The following International communities or organizations that use ISO 3166-1 are:

- Finance and Commerce
- Internet-ccTLD [.us]
- European Commission/Union,
- IC Security Markings/DoD Message Clearance traffic
- NATO
- DoD Coalition partners
- Numerous international commercial vendors.

Discussion point – certain organizations cite the need to have additional codes for local or mission-specific purposes.

- ISO provides the ability to “reserve” codes for the use of a particular country. USA has such codes reserved, and there is room to expand this profile as needed. These codes can be added independently of UN/ISO
- There are unassigned three-letter codes that can be used locally, that will never be used by ISO. AAA to AAZ, QMA to QZZ, XAA to XZZ and ZZA to ZZZ. Certain codes are reserved or withdrawn.

Current applications of trigraph in Federal Government

- Broad use of the trigraph already exists
 - Trigraph is used by the CIA, NATO, UN
 - NGA is moving to ISO trigraph
 - Within the Federal and DoD Acquisition and Logistics space, the following enterprise systems (which often feed many DoD systems with country code data) use trigraph:
 - CCR (Federal)
 - eSRS (Federal)
 - FBO (Federal)
 - FPDS-NG (Federal)
 - ORCA (Federal)
 - DoDAAD (they carry 5 codes, of which this is one, DoD)

Related policy

USD (I) memo Sept 27, 2004 “Security Classification Marking Instructions” indicates that in order to share data with our foreign partners, references the applicable country

trigraph as the preferred identification of countries to which the information is releasable “to enable electronic identification and isolation of the data.”

System Impacts

- Original argument for two-character seems to be that it’s a “space-saver” in system databases, which was valid at the time these systems were developed, but less of a concern now.
- Many DoD logistics and other types of systems are not set up currently to be able to handle three character country codes. Implementing such a change today would be significant in terms of cost and effort, for an ROI that is not immediately quantifiable.
- However, during the implementation/transition period, DoD will provide a translation service, so that changes do not need to be made to the native system, rather, the outputs can be run through the service and be converted to the preferred format. The system will simply need to identify which type of code they are using now to enable proper translation. This will minimize the need for immediate system changes, and spread eventual costs out until such time as the systems will naturally be refreshed, so they can be combined with other system changes.

Conclusion/Recommendation

The Department would benefit on many levels by moving to a single standard. As a standard, trigraph is superior; main objection to use of trigraph is a legacy system environment that does not currently allow for it. If mediation can be provided for a long term implementation period (10+ years), it is desirable to move to the three character code.

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