

Recommended XML Namespace for Government Organizations

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INTRODUCTION

The Extensible Markup Language (XML) is rapidly becoming the technology of choice for information technology (IT) and Internet-based data exchange solutions. A key aspect in the development and deployment of XML is the use of namespaces. According to the World Wide Web Consortium (W3C), the purpose of XML namespaces is to “provide a simple method for qualifying element and attribute names used in Extensible Markup Language documents by associating them with namespaces identified by URI references.”¹ Namespace associations allow XML implementers to use diverse XML vocabularies without fear of name collision resulting in invalid XML. To ensure consistency, organizations should decide on a namespace strategy and a naming convention when establishing organizational namespaces.

The federal government is actively engaged in developing and deploying XML. It is critical that the government establish a cohesive, coordinated namespace approach to support its various XML efforts. This namespace approach must define a standardized structure for federal namespace as well as establish a standardized naming convention for those namespaces. Without such a coordinated approach, individual government organizations will create a proliferation of disparate XML namespace structures and names resulting in chaotic management of XML components.² Given the ever expanding proliferation of federal namespaces, it is

¹ World Wide Web Consortium, Namespaces in XML, January 14, 1999.

² Following is a list of definitions of XML components (artifacts):

Standard markup—XML element and attribute names and tags.

Schema components—developer-defined entities and datatypes.

Schemas—mappings of logical models of business processes and the parcels of information exchanged in these processes to physical XML Schemas or document-type definitions (DTDs).

Stylesheet—part of the family of recommendations for defining XML document transformation and presentation.

Namespace associations—the associations owned by the namespace.

crucial that this strategy be put in place as quickly as possible since harmonizing the namespace structure and names used by different government organizations will become increasingly difficult over time.

The General Services Administration (GSA) asked LMI to recommend a strategy and naming convention that could be used throughout the government. This strategy is intended to be a central source of guidance to enable all trading partners of the U.S. government to develop their XML namespaces using a common strategy. This XML namespace strategy also will promote an organized roll-out of the government's ever-expanding array of XML components.

In this report we describe three options for deciding an architectural namespace strategy—no namespace, single namespace, and multiple namespaces—and provide recommendations on the use of each. We also explore the use of the Uniform Resource Name (URN) and Uniform Resource Locator (URL) variants of Uniform Resource Indicators (URIs) for a government namespace naming convention and provide recommendations for their use. Finally, we outline the actions necessary to implement our recommendations.

BACKGROUND

The concept of XML namespaces is defined in the W3C XML namespaces technical specification.³ XML namespace features are available in the W3C XML Schema (XSD) and in document-type definitions (DTDs).⁴ Because most new XML development work is being done using schemas and the *Draft Federal XML Developer's Guide* recommends using XSD, our discussions focus on the use of namespaces in XSD.⁵ To help the reader understand the concepts involved and the reasons for our subsequent recommendations, the following subsections explain the concepts of namespace declaration and qualification and target namespaces.

Namespace Declaration and Qualification

A namespace is declared in the root element of a Schema using a namespace identifier. This namespace identifier must be a URI reference that conforms to the Internet Engineering Task Force (IETF) Request For Comments (RFC) 2396, *Uniform Resource Identifiers: Generic Syntax*.⁶ Schema constructs are associated with a namespace identifier through a user-defined namespace prefix, making the

³ World Wide Web Consortium, *Namespaces in XML*, January 14, 1999.

⁴ In the remainder of this document, the use the term schema (lowercase s) as a generic term to identify the family of grammar-based XML document structure validation languages including the more formal W3C XML Schema Technical Specification (referred to as Schema with an uppercase S or XSD), Document Type Definition, Schematron, Regular Language Description for XML (RELAX), and the OASIS RELAX NG.

⁵ Federal CIO Council XML Working Group, *Draft Federal XML Developer's Guide*, April 2002.

⁶ T. Berners-Lee, R. Fielding, L. Masinter; Internet Engineering Task Force (IETF) RFC 2396, *Uniform Resource Identifiers (URI): Generic Syntax*; Internet Society; August 1998.

constructs “namespace qualified.” In the following example, the namespace identifier is `urn:us:gov:gsa` and the namespace prefix is `gsa`:

```
<schema xmlns:gsa="urn:us:gov:gsa">
```

This means that any construct in the Schema with a namespace prefix of `gsa` belongs to the GSA namespace, as in the following example:

```
<element name="gsa:FederalAcquisitionRegulationIndicator"
  type="xsd:boolean"/>
```

Namespaces allow constructs with the same name but from different markup vocabularies to be used in the same Schema with no adverse effects. In the following example, two `State` elements are used in the same Schema, but they are associated with two different namespaces. One element represents a U.S. state abbreviation (AK, AL, AR) in the EPA’s namespace, while the other represents the state of water quality (acidic, basic, high turbidity) in a specific state’s environmental department namespace:⁷

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:epa="urn:us:gov:epa"
  xmlns:vadeq="urn:us:gov:va:state:environmental">
  <xsd:element name="epa:State" type="epa:StatePostalCodeType"/>
  <xsd:element name="vadeq:State"
    type="vadeq:WaterQualityIndicatorType"/>
  <!--information removed for example purposes-->
</xsd:schema>
```

If the `State` elements described above were not in separate namespaces, an XML processor would generate an error. This condition is known as “name collision.”

Namespace declaration and qualification have the following advantages:

- ◆ Namespaces associate schema constructs with a conceptual space.
- ◆ Namespace qualification of schema constructs identifies the namespace where the constructs belong.
- ◆ Namespaces allow use of constructs with the same name but from different markup vocabularies in the same schema with no adverse effects.

⁷ This is for example only, and it does not represent current U.S. government environmental namespaces.

Namespace declaration and qualification have the following disadvantage:

- ◆ Namespace qualification of schema constructs can increase verbosity.

In the following example, the instance has no namespace qualification:

```
<AgencyName>GSA</AgencyName>
<AgencyID>9986</AgencyID>
<ContactPartyID>222345897</ContactPartyID>
<OrderedQuantity>100</OrderedQuantity>
<OrderedQuantityAmount>399</OrderedQuantityAmount>
```

In this example, the instance has namespace qualification:

```
<gsa:AgencyName>GSA</gsa:AgencyName>
<gsa:AgencyID>9986</gsa:AgencyID>
<gsa:ContactPartyID>222345897</gsa:ContactPartyID>
<gsa:OrderedQuantity>100</gsa:OrderedQuantity>
<gsa:OrderedQuantityAmount>399</gsa:OrderedQuantityAmount>
```

In summary, although namespace qualification of Schema constructs can increase verbosity as shown in the example, the ability to easily identify the namespace where a construct belongs (visually or automatically) is valuable. Use of namespaces will be valuable for the U.S. government because it allows constructs developed in different areas to be associated with their own unique conceptual space.

Target Namespaces

The declaration of a target namespace in a Schema indicates that the Schema is acting as a “collector” of constructs declared in it. While a Schema may have more than one declared namespace, only one namespace can be designated as the target namespace. It is not required that a target namespace be declared in a Schema.

A target namespace is declared using the namespace identifier of the selected namespace. In this example, the `urn:us:gov:gsa` namespace is declared as the target namespace:

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:gsa="urn:us:gov:gsa"
  targetNamespace="urn:us:gov:gsa">
```

This means that any element, attribute, or data type declared in the Schema belongs to the Schema's target namespace.

The advantage of a target namespace is that a declaration of a target namespace in a Schema indicates that the Schema is acting as a "collector" of constructs declared within it. The disadvantage of a target namespace is that other users of a Schema so declared will need to reference the declared target namespace.

In summary, target namespaces are valuable because they allow a set of Schema constructs to be collected into a single conceptual space. This allows the constructs to be identified as a single set of constructs.

ARCHITECTURAL NAMESPACE STRATEGY

An organization can choose to have no target namespace; one target namespace (referred to as a single namespace configuration) that is used for all Schemas within the organization, or multiple target namespaces (referred to as a multiple namespace configuration). We outline the advantages and disadvantages of each option in the following subsections and we offer guidance or a recommendation with a justification on each option.

No Namespace

A Schema does not need to declare a target namespace. When a namespace is not declared, it is referred to as the "no namespace" option.

No Namespace Option

Advantages and disadvantages	
Advantages:	Having no namespace provides for clean instance documents because prefixes aren't needed to qualify the constructs.
Disadvantages:	Using no namespace keeps the original basis of the XML constructs invisible in the instance document caused by the lack of prefixes. Not using a namespace makes it possible for a no-namespace schema (schema A), when used by another schema with a declared namespace (schema B), appear to be part of schema B's namespace.
Guidance or recommendation	
Government organization schemas SHOULD use namespaces.	
Justification	
Namespaces provide a method of tying XML components to a particular scope. Having no namespaces causes confusion and increases the time required to discern the origin of XML constructs because no identifier is provided.	

Single Namespace Configuration

Under a single namespace concept, all XML components reference the same namespace, regardless of department Agency, or initiative focus. The implication of having a single namespace for the federal government is that all elements and attributes need to be unique.

Single Namespace Option

Advantages and disadvantages	
Advantages:	A single namespace enforces front-end agreement of elements and attributes. ^a
	A single namespace does not allow duplication of XML construct semantic names.
Disadvantages:	A single namespace increases the risk of name collision.
	A single namespace may not be adopted voluntarily because it uses proportionately more resources in the short run.
Guidance or recommendation	
The U.S. government SHOULD NOT use a single-namespace configuration. Individual government organizations MAY use a single-namespace configuration.	
Justification	
A single namespace is ideal for ensuring maximum interoperability; however, because of the size, scope and requirements of the U.S. government, having a single namespace is not practical for the volume of metadata anticipated. Individual government organizations may choose to have a single namespace to promote the highest level of interoperability, depending on the size of the organization and its requirements.	

^a“Front-end” means organizations need to harmonize data or make various data constructs conform to each other when XML Schemas are created rather than waiting until harmonizing data is required to accommodate back-end needs as often happens after XML Schemas have been created.

Multiple Namespace Configuration

The multiple namespace configuration allows an infinite number of namespaces. For the federal government, the configuration should be one namespace for federal enterprise level XML components and one base namespace for each department and agency. For departments and agencies, the configuration should be at the option of the organization to create its own namespace strategy for multiple namespaces as a subset of its base namespace. If a government organization opts not to create a base namespace, it may use the federal enterprise namespace. In addition to enterprise level XML components, the federal enterprise namespace could hold shared XML constructs that other schemas could reference. The moderation of shared XML components is crucial to the success of such a strategy. Each government organization needs to modify existing shared XML components to harmonize them across all government organizations before placing them into the federal enterprise namespace. Each government organization would control the content of its own namespace.

Multiple Namespace Option

Advantages and disadvantages	
Advantages:	<p>A multiple-namespace configuration decreases the risk of name collision.</p> <p>A multiple-namespace configuration enables an organization's structure to be represented by the namespaces.</p> <p>A multiple-namespace configuration can call out a single enterprise namespace to promote interoperability, while organization-specific namespaces promote flexibility for rapid implementation.</p> <p>One federal enterprise namespace will provide a common namespace for shared elements, attributes, and data types.</p> <p>Using different namespaces for each government organization will enable rapid development of government organization XML schema without the need to harmonize across the entire U.S. government.</p> <p>Using one namespace for each government organization will ensure maximum flexibility in naming XML constructs, with the namespace providing the semantic context.</p> <p>Using one namespace for each government organization will ensure the XML constructs in U.S. government schemas can be identified easily because of the constructs' unique namespaces.</p> <p>Using one namespace for each government organization will give a context to the namespace that could provide presentation opportunities for schemas using Extensible Style Language (XSL) in the future.</p>
Disadvantages:	<p>A multiple-namespace configuration becomes more complex as more namespaces are used.</p> <p>A multiple-namespace configuration does not enable the highest degree of interoperability.</p> <p>A multiple-namespace configuration requires the use of the "import" construct for external schema references, increasing the complexity of government schemas.</p> <p>Using one namespace for each government organization discourages harmonizing within the U.S. government.</p> <p>Using one namespace for each government organization will be complex.</p>
Guidance or recommendation	
The U.S. government SHOULD use multiple namespaces. Government organizations SHOULD adopt the strategy of referencing the shared federal enterprise namespace and define its own namespace architecture strategy.	

Multiple Namespace Option (Continued)

Justification
<p>Creating a “shared” namespace for housing commonly used XML constructs mitigates the risk of lowering interoperability. The shared namespace may also be used by organizations that do not want to maintain their own namespace.</p> <p>Allowing namespaces for individual government organizations increases flexibility and initially reduces development cost and time. The additional complexity of multiple namespaces is minimal compared to the additional flexibility provided by the solution.</p> <p>In the long run, as documents are passed between more systems, additional mapping and translation of the same element in multiple namespaces will need to be harmonized. If the naming conventions prescribed by the <i>Draft Federal XML Developer’s Guide</i> are used, creating semantically unique names in different agencies should not be overly burdensome.</p> <p>Having a namespace for each organization will create a complex XML namespace architecture, but this is necessary to develop a robust network of U.S. government schemas.</p>

NAMING CONVENTIONS

Technical Options

A namespace declaration requires a uniform resource identifier (URI). As defined in RFC 2396, a URI is a “compact string of characters for identifying an abstract or physical resource.”⁸ A URI scheme can be “a locator, a name, or both.”⁹ A URI locator scheme is in the form of a uniform resource locator (URL) and a URI name scheme is of the form of a uniform resource name (URN). URLs generally define a location, but are not required to be a resolvable Internet or World Wide Web address. URNs are required to provide a globally unique and persistent reference even if the URL subset of the URI scheme ceases to exist.

⁸ T. Berners-Lee, R. Fielding, L. Masinter; Internet Engineering Task Force (IETF) RFC 2396 *Uniform Resource Identifiers (URI): Generic Syntax*; Internet Society; August 1998.

⁹ T. Berners-Lee, R. Fielding, L. Masinter; Internet Engineering Task Force (IETF) RFC 2396, *Uniform Resource Identifiers (URI): Generic Syntax*; Internet Society; August 1998.

URLs are generally recognized in the public at large as hypertext transfer protocol (http) Internet addresses; however, this is not correct. In fact, a URL is really a dated colloquialism that refers to one of a number of URI locator scheme types to include^{10,11}

- ◆ HTTP
- ◆ file transfer protocol (FTP)
- ◆ gopher
- ◆ mailto
- ◆ news
- ◆ telnet.

For the purposes of this paper, we focus on URI HTTP schemes when discussing URI locator schemes, and use the generally accepted notation of URL to represent such schemes. An HTTP URL is of the form:¹²

```
http_URL = "http:" "//" host [ ":" port ] [ abs_path [ "?" query ] ]
```

The host component is commonly referred to as the domain component. Management of URLs within the federal government—that is, maintenance of unique identifiers that constitute the host or domain component of a URL—is institutionalized in the federal government and the subordinate states and municipalities. The domain (host) component is managed by several agencies. Currently, GSA is responsible for managing the `dot-gov` domain, the Department of Commerce manages the `dot-us` domain, and the Department of Defense manages the `dot-mil` domain.¹³ Domains are segmented into a hierarchy of levels—such as first (or top), second, third. Each domain level has its own unique management requirements as defined at <http://www.nic.mil/faq.html>.

¹⁰ T. Berners-Lee, R. Fielding, L. Masinter; Internet Engineering Task Force (IETF) RFC 2396, *Uniform Resource Identifiers (URI): Generic Syntax*; Internet Society; August 1998.

¹¹ M. Mealling & R. Denenberg; Internet Engineering Task Force (IETF) RFC 3305, *Report from the Joint W3C/IETF URI Planning Interest Group: Uniform Resource Identifiers (URIs), URLs, and Uniform Resource Names (URNs): Clarifications and Recommendations*, Internet Society, August 2002.

¹² T. Berners-Lee et al.; Internet Engineering Task Force (IETF) RFC 2616; *Hypertext Transfer Protocol –HTTP/1.1*; Internet Society, June 1999.

¹³ See <http://www.nic.mil/faq.html>, accessed March 27, 2003.

URN Option

Advantages and disadvantages	
Advantages:	URNs are designed “with the specific goal of providing persistent naming of resources.” ^a
Disadvantages:	A Request for Comment (RFC) ^b for registration of a namespace identifier will need to be made to the Internet Assigned Numbers Authority.
Guidance or recommendation	
Government organization schemas SHOULD use URNs for namespaces.	
Justification	
URNs are designed as persistent names, a requirement for a schema namespace. The short-term disadvantage of needing to register the namespace identifier is outweighed by the long-term advantage of a registered persistent name. URL domain names are already managed by the GSA domain registration. URNs can take advantage of this service as discussed later in this document. In addition, although not a requirement, URNs can be registered in a global namespace identifier directory, providing the same opportunity as a URL to be resolvable and store information pertinent to the schema. ^c In addition, the schemaLocation attribute may be used to provide information on where the Schema resides, rather than trying to use a namespace to identify a storage location.	

^a RFC 3406 (October 2002) is available at <http://www.ietf.org/rfc/rfc3406.txt>.

^b RFCs are managed by the Internet Engineering Task Force, and they are the equivalent of International Organization for Standardization (ISO) standards.

^c Mechanisms for URN resolution and use in Internet applications are proposed in RFC 3401 and RFC 3405. See IETF RFC 3406 *Uniform Resource Names (URN) Namespace Definition Mechanisms*, October 2002.

URL Option

Advantages and disadvantages	
Advantages:	Additional information regarding a schema may be stored at the URL. The <code>dot-gov</code> URLs have an established registry to ensure uniqueness.
Disadvantages:	A URL may cause confusion because people expect the URL to be resolvable, when in fact this is not required.
Guidance or recommendation	
Government organization schemas MAY use URLs for namespaces. When using URLs, the corresponding URN syntax MUST also be registered.	
Justification	
URLs are designed as location identifiers rather than persistent names. URLs lead to great confusion regarding XML namespaces because people assume an XML namespace in the form of a URL will be resolvable. While URNs are preferred, some organizations may find using URLs beneficial because they have already created a number of Schemas using a URL, they have other systems dependant on the URL namespace, or other reasons. In addition, URL domain names are already managed by the GSA domain registration.	

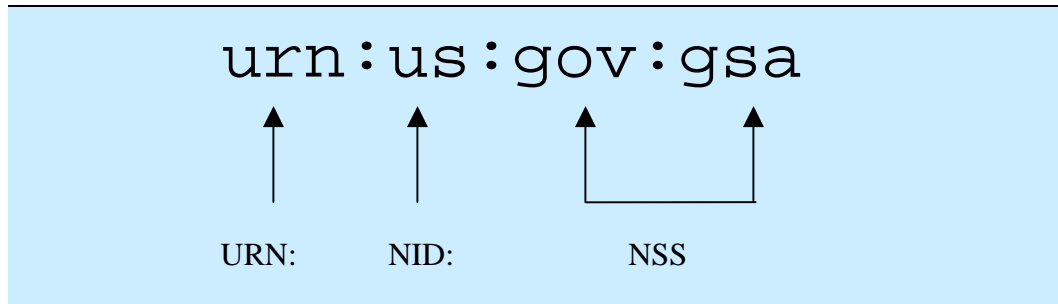
Recommended Naming Convention

A naming convention and a source of management is required for namespaces. As stated previously, GSA manages the `dot-gov` top-level domains for URLs.¹⁴ Government organizations as defined at <http://www.nic.gov/> are qualified to pursue a `dot-gov` registration. Qualified government organizations may register for second- and third-level domains. XML namespaces should use the registered domains of government organizations in the `dot-gov` domain to create unique namespace URIs, whether they use a URN or URL syntax. When a URL is registered at <http://www.nic.gov/>, it must be reserved in both the URL and URN syntax for use as a namespace for the registering organization. This methodology will ensure no duplication of namespaces, and the current registration structure will act as a centralized point of unique namespace management. The recommended naming conventions for URN and URL syntaxes follow.

¹⁴ See <http://www.nic.gov/index.html>, accessed March 13, 2003.

URN NAMING CONVENTION

Our proposed structure follows the structure defined by the IETF Network Working Group in RFC 2141. That structure contains the uniform resource identifier consisting of “urn,” the namespace identifier (NID), and namespace-specific string (NSS).¹⁵ Following is an example:



We propose the NID be represented by the string “US”. We propose the NSS conform to the second- and/or third-level domain as registered with the GSA [Government Domain Registration and Services](#).¹⁶ Further hierarchical segmenting of the URN would be at the government organization’s discretion. A prudent measure for organizations choosing to use the recommendations in this paper is to manage the further hierarchical segmenting of URNs in their organizations to ensure uniqueness and avoid chaos; however, additional management of namespaces at an organization level is not required to adopt the proposed recommendation in this paper.

Following are some *notional* examples of how the naming convention would be applied to different government organizations using a URN:

- ◆ *United States Environmental Protection Agency (USEPA)*—USEPA has registered `epa.gov`. Following our recommendation, the URN would be `urn:us:gov:epa`.
- ◆ *General Services Administration*—GSA has registered `gsa.gov`. Following our recommendation, the URN would be `urn:us:gov:gsa`.
- ◆ *The Office of the U.S. Courts*—The Office of the U.S. Courts has registered `uscourts.gov`.¹⁷ Following our recommendation, the URN would be `urn:us:gov:uscourts`.

¹⁵ R. Moats; Internet Engineering Task Force (IETF) RFC 2141: *URN Syntax*; Internet Society, May 1997.

¹⁶ GSA manages registrations at the Network Information Site (NIC) located at <http://www.nic.gov>.

¹⁷ See http://www.nic.gov/whois_search_results2.html.

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- ◆ *The U.S. District Court for Eastern District of Pennsylvania*—The U.S. District Court for Eastern District of Pennsylvania has a URL of `http://www.paed.uscourts.gov/`. Although the “paed” extension of the URL is not registered with GSA NIC, it is the registered domain owner’s right to further extend the URN, therefore, a further delineation of `uscourts.gov` enables the Eastern District of Pennsylvania to have its own URN, `urn:us:gov:uscourts:paed`.
 - ◆ *The Department of Defense*—DoD has `dod.gov` registered; consequently, the available XML URN is `urn:us:gov:dod`. DoD would have the option to further delineate this URN to accommodate its individual agencies:
 - `urn:us:gov:dod:don`
 - `urn:us:gov:dod:don:navy`
 - `urn:us:gov:dod:don:usmc`
 - `urn:us:gov:dod:doa`

DoD would be responsible for managing the delineation of the namespace past the second-level registered domain, as would other agencies that want to further extend their URNs.

In some cases, government (and potentially non-government) organizations could use this same structure for non `dot-gov` registered domains. This would be the case for a community of interest such as the environment community made up of states and a federal agency, the domain called the Environmental Information Exchange Network (Exchange Network). The Exchange Network has registered the domain `exchangenetwork.net`; the appropriate URN would be `urn:us:net:exchangenetwork`. Similarly, the justice community of interest is planning to register `global.gov`; the URN would be `urn:us:gov:global`. The DoD may choose to use `urn:us:mil:dod` instead of `urn:us:gov:dod`, although this choice is not recommended.

URN Based on a Registered Domain Name

Advantages and disadvantages	
Advantages:	Using this structure ensures uniqueness through the use of the domain registry. The domain registry is already established and stable. Government organizations are free to create their URNs through the use of the domain registry process. Government organizations are free to create as many delineated URNs from their registered URL as necessary to fulfill their individual requirements.
Disadvantages:	The NID “us” must be registered.
Guidance or recommendation	
Government organization schemas SHOULD follow the urn:us: “registered domain” structure. Other organizations MAY consider similar adoption.	
Justification	
This structure is based on a lesson learned. RFC 1480, published in June 1993, proposed a comprehensive, yet fairly complex hierarchy for government organizations. The hierarchy was never adopted. In a market-driven system where the best recommendations become de facto standards, the complex hierarchical system failed. The above mechanism is based on registered domain names where the naming convention is part of Proposed Rule 41 CFR Part 102-173.	

URL NAMING CONVENTION

If an organization decides to use a URL, the domain portion of the URL at the second and third levels should match what has been registered at <http://www.nic.gov/>.

Use of additional domain levels for additional hierarchical segmenting of the URL would be at the discretion of the government organization. A prudent measure for organizations that choose to use the recommendations in this paper is to manage the further hierarchical segmenting of URLs in their organizations to ensure uniqueness and avoid chaos; however, additional management of namespaces at an organizational level is not required to adopt the proposed recommendation in this paper.

The following gives *notional* examples of how the naming convention would be applied to different government organizations using a URL:

- ◆ *United States Environmental Protection Agency (USEPA)*—USEPA has registered `epa.gov`. The URL namespace would be `http://www.epa.gov`.
- ◆ *General Services Administration*—GSA has registered `gsa.gov`. The URL namespace would be `http://www.gsa.gov`.

URL Based on a Registered Domain Name

Advantages and disadvantages	
Advantages:	Using this structure ensures uniqueness through the use of the domain registry. The domain registry is already established and stable. Government organizations are free to create their URLs through the use of the domain registry process. Government organizations are free to create as many delineated URLs from their registered URL as necessary to fulfill their individual requirements.
Disadvantages	The recommended federal approach is to use a URN, which is in line with current trends in open standards bodies. ^a
Guidance or recommendation	
Government organizations deciding not to use the preferred URN solution, MAY use URLs. If a URL is used, its second and third levels MUST be registered with the GSA NIC and a corresponding URN expression MUST also be registered.	
Justification	
Following a standard naming convention allows organizations to implement registered URLs as namespaces with the assurance that they are using a unique namespace that after it is registered, is reserved for an organization's use.	

^a For example, the Organization for the Advancement of Structured Information Standards (OASIS) Universal Business Language (UBL) Technical Committee has opted to use a URN.

NEXT STEPS

If our recommended federal namespace strategy and government-wide naming convention is accepted, GSA should take the following actions:

- ◆ Work with the appropriate office in the Department of Commerce to request a formal namespace and seek a review by the Internet Engineering Task Force (IETF) in accordance with IETF RFC 3406, *Best Current Practice Uniform Resource Names (URN) Namespace Definition Mechanism for the "US" NID*.
- ◆ As lead for the developing federal XML registry, define requirements for the federal registry based on a decision to recommend URNs for XML namespaces.
- ◆ As the authority for the dot-gov domain, investigate the ability to automatically reserve the corresponding URN for an organization that has registered a dot-gov URL and subsequently automatically register the URN with the federal registry.

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- ◆ In its capacity of operating the Office of Electronic Government, promulgate this paper on xml.gov as a recommended best practice and take other necessary actions to ensure government-wide distribution.
 - ◆ As a member of the federal CIO XML Working Group, recommend the XML Working Group incorporate this strategy and naming convention in the next version of the *Federal XML Developers Guide* and write this strategy in the form of official policy.