

# COMMONWEALTH OF PENNSYLVANIA

## DEPARTMENT OF HUMAN SERVICES

### INFORMATION TECHNOLOGY STANDARD

|   |   |
|---|---|
| Name Of Standard:<br><b style="text-align: center;">Routing Protocols and Subnet Validation</b> | Number:<br><b style="text-align: center;">STD-ENSS021</b>   |
| Domain:<br><b style="text-align: center;">Network</b>   | Category:<br><b style="text-align: center;">Wide, Metropolitan &amp; LAN's / Protocols</b>                    |
| Date Issued:<br><b style="text-align: center;">05/09/2001</b>                                   | Issued By Direction Of:<br> |
| Date Reviewed:<br><b style="text-align: center;">03/07/2016</b>                                 | Clifton Van Scyoc, Chief Technology Officer   |

#### Abstract:

*Open Shortest Path First (OSPF)* is a routing protocol developed for Internet Protocol (IP) networks by the Interior Gateway Protocol (IGP) working group of the Internet Engineering Task Force (IETF). The working group was formed in 1988 to design an IGP based on the Shortest Path First (SPF) algorithm for use in the Internet. Similar to the Interior Gateway Routing Protocol (IGRP), OSPF was created because in the mid-1980s, the Routing Information Protocol (RIP) was increasingly incapable of serving large, heterogeneous internetworks.

*Border Gateway Protocol (BGP)* is an exterior gateway protocol designed in 1994 to exchange routing and reachability information between autonomous systems on the Internet. The Border Gateway Protocol does not use Interior Gateway Protocol metrics, but makes routing decisions based on paths, network policies and/or rule-sets configured by a network administrator. The Border Gateway Protocol plays a key role in the overall operation of the Internet and is involved in making core routing decisions.

Static routing provides a means of explicitly defining the next hop from a router for a particular destination.

A subnet is a portion of a network that shares a common address component. On TCP/IP networks, subnets are defined as all devices whose IP addresses have the same prefix. For example, all devices with IP addresses that start with 100.100.100. would be part of the same subnet. Dividing a network into subnets is useful for both security and performance reasons. IP networks are divided using a subnet mask.

#### General:

The purpose of this document is to inform the reader regarding Router Protocol and Subnet Validation at the Department of Human Services (DHS).

#### Standard:

##### **DHS Router Protocol and Subnet Validation Standards**

Any router connected to the network must use static route protocols or OSPF (Open Shortest Path First) protocol or BGP (Border Gateway Protocol) protocol.

A default static route will be configured in each remote router to direct all valid traffic to a specific destination only. In the case of the Department's network, this destination is the main DHS hub router in Harrisburg. This hub router will have static routes configured for all remote subnets that require Departmental network access. Subnet addresses submitted by a remote user must be specified down to the third octet (i.e. 199.999.8.X where 8 is the third octet).

### **Exemptions from this Standard:**

There will be no exemptions to this standard.

### **Refresh Schedule:**

All standards and referenced documentation identified in this standard will be subject to review and possible revision annually or upon request by the DHS Information Technology Standards Team.

### **Standard Revision Log:**

| <b>Change Date</b> | <b>Version</b> | <b>Change Description</b>            | <b>Author and Organization</b> |
|--------------------|----------------|--------------------------------------|--------------------------------|
| 05/09/2001         | 1.0            | Document Creation                    | Unknown                        |
| 04/30/2004         | 1.1            | Revised                              | Tim Stouffer                   |
| 12/14/2004         | 1.2            | Updated                              | Tim Stouffer                   |
| 07/13/2005         | 1.2            | Reviewed content – No changes        | Tim Stouffer                   |
| 11/13/2006         | 1.2            | Reviewed content – No changes        | Doug Rutter                    |
| 03/19/2010         | 1.3            | Reviewed and edited style            | Doug Rutter                    |
| 09/24/2010         | 1.3            | Reviewed content – No changes        | Doug Rutter                    |
| 02/22/2011         | 1.4            | Reviewed content – No changes        | Doug Rutter                    |
| 12/17/13           | 1.5            | Updated                              | Robert Gordon                  |
| 04/06/2015         | 1.6            | Updated to reflect DPW change to DHS | Robert Gordon                  |
| 03/07/2016         | 1.7            | Updated the CTO's name               | Aamir Qureshi, BIS-DTE         |