

| Design Concern                                 | BGP Add Path                                                                                                                                 | BGP Shadow RR                                                                                                                                          | BGP Shadow Sessions                                                                                                                         | MPLS Unique RD per PE per VRF                                                                                                         |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Best in MPLS                                   | No                                                                                                                                           | No                                                                                                                                                     | No                                                                                                                                          | Yes                                                                                                                                   |
| How many IBGP Session between RR and RR-Client | One IBGP session, Path IDs are different for different next-hop                                                                              | One session per route reflector. If there is only one more Shadow RR which sends second best path, two IBGP sessions on the RR Client, one for each RR | One session per next-hop. Only one RR but multiple separate IBGP session is required between RR and RR Client                               | One IBGP session between VPN RR and RR Client, different RDs make the same IP prefixes unique                                         |
| Resource Requirement                           | Best                                                                                                                                         | Worst, requires separate RR and IBGP session per next-hop                                                                                              | Better than Shadow RR because doesn't require separate Route reflector, worse than ADD path because require extra IBGP session per next-hop | Same as Add-path, doesn't require extra IBGP session or Route Reflector                                                               |
| Migration of existing Route Reflectors         | Very hard, all Route Reflectors and clients need to be upgraded to support Add-path                                                          | Easy, only Route Reflector code needs to be upgraded                                                                                                   | Easy, only Route Reflector code needs to be upgraded                                                                                        | Easiest because there is no upgrade on any device. Only unique/separate Route Distinguisher needs to be configured on the PEs per VRF |
| Standard Protocol                              | Yes IETF Standard                                                                                                                            | Yes IETF Standard                                                                                                                                      | Yes IETF Standard                                                                                                                           | Yes IETF Standard                                                                                                                     |
| Stuff Experience                               | Not well known                                                                                                                               | Not well known                                                                                                                                         | Not well known                                                                                                                              | Known                                                                                                                                 |
| Troubleshooting                                | Hard, default behaviour of BGP which is advertising only one best path is changing. Operation stuff needs to learn new troubleshooting skill | Easy                                                                                                                                                   | Easy                                                                                                                                        | Easy                                                                                                                                  |
| IPv6 Support                                   | Yes                                                                                                                                          | Yes                                                                                                                                                    | Yes                                                                                                                                         | Yes                                                                                                                                   |
| Provisioning                                   | Easy, only one IBGP session between Route reflector and the client                                                                           | Hard, one IBGP session per next-hop                                                                                                                    | Hard, one IBGP session per next-hop                                                                                                         | Easiest, only the consideration is to have unique RD per VRF per PE                                                                   |