

Chapter 2

Complete Routing and Routing Protocol Configuration Statements

This chapter shows the complete configuration statement hierarchy for the portions of the configuration discussed in this manual, listing all possible configuration statements and showing their level in the configuration hierarchy. When you are configuring the JUNOS software, your current hierarchy level is shown in the banner on the line preceding the user@host# prompt.

For a list of the complete configuration statement hierarchy, see the *JUNOS Internet Software Configuration Guide: Getting Started*.

This chapter is organized as follows:

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[edit protocols] Hierarchy Level

```
protocols {
  BGP    bgp {
    advertise-inactive;
    authentication-key key;
    cluster cluster-identifier;
    damping;
    description text-description;
    disable;
    export [ policy-names ];
    family (inet | inet6 | inet-vpn | l2-vpn) {
      (any | multicast | unicast) {
        prefix-limit {
          maximum number;
          teardown <percentage> <idle-timeout (forever | minutes)>;
        }
        rib-group group-name;
      }
    }
  }
}
```



```

graceful-restart {
    disable;
    restart-time seconds;
    stale-routes-time seconds;
}
hold-time seconds;
import [ policy-names ];
ipsec-sa ipsec-sa;
keep (all | none);
local-address address;
local-as autonomous-system <private>;
local-preference local-preference;
log-updown;
metric-out (metric | minimum-igp <offset> | igp <offset>);
multihop <tth-value>;
multipath;
no-aggregator-id;
no-client-reflect;
out-delay seconds;
passive;
peer-as autonomous-system;
preference preference;
protocol protocol;
remove-private;
traceoptions {
    file name <replace> <size size> <files number> <no-stamp>
        <(world-readable | no-world-readable)>;
    flag flag <flag-modifier> <disable>;
}
type type;
neighbor address {
    advertise-inactive;
    as-override;
    authentication-key key;
    cluster cluster-identifier;
    damping;
    description text-description;
    export [ policy-names ];
    family (inet | inet6 | inet-vpn | I2-vpn) {
        (any | multicast | unicast) {
            prefix-limit {
                maximum number;
                teardown <percentage> <idle-timeout (forever | time-in-minutes)>;
            }
            rib-group group-name;
        }
        labeled-unicast {
            prefix-limit {
                maximum number;
                teardown <percentage> <idle-timeout (forever | time-in-minutes)>;
            }
            resolve-vpn;
            rib-group group-name;
        }
    }
}
graceful-restart {
    disable;
    restart-time seconds;
    stale-routes-time seconds;
}
hold-time seconds;
import [ policy-names ];
ipsec-sa ipsec-sa;

```



```

interface interface-name {
    disable;
    checksum;
    csnp-interval (seconds | disable);
    lsp-interval milliseconds;
    mesh-group (value | blocked);
    passive;
    level level-number {
        disable;
        hello-authentication-key key;
        hello-authentication-type authentication;
        hello-interval seconds;
        hold-time seconds;
        metric metric;
        passive;
        priority number;
        te-metric metric;
    }
}
}

OSPF ospf {
    disable;
    domain-id domain-id;
    domain-vpn-tag number;
    export [ policy-names ];
    external-preference preference;
    graceful-restart {
        disable;
        helper-disable;
        notify-duration seconds;
        restart-duration seconds;
    }
    overload {
        <timeout seconds>;
    }
    preference preference;
    reference-bandwidth reference-bandwidth;
    rib-group group-name;
    route-type-community (vendor | iana);
    traffic-engineering {
        no-topology;
        shortcuts;
    }
    traceoptions {
        file name <replace> <size size> <files number> <no-stamp>
            <(world-readable | no-world-readable)>;
        flag flag <flag-modifier> <disable>;
    }
    area area-id {
        area-range network/mask-length <restrict>;
        authentication-type authentication;
        interface interface-name {
            disable;
            authentication-key key <key-id identifier>;
            dead-interval seconds;
            hello-interval seconds;
            interface-type type;
            metric metric;
            neighbor address <eligible>;
            passive;
            poll-interval seconds;
            priority number;

```

```

    retransmit-interval seconds;
    transit-delay seconds;
  }
  label-switched-path name metric metric;
  nssa {
    area-range network/mask-length <restrict>;
    default-lsa {
      default-metric metric;
      metric-type type;
      type-7;
    }
    (no-summaries | summaries)
  }
  stub <default-metric metric> <(no-summaries | summaries)>;
  virtual-link neighbor-id router-id transit-area area-id {
    disable;
    authentication-key key <key-id identifier>;
    dead-interval seconds;
    hello-interval seconds;
    retransmit-interval seconds;
    transit-delay seconds;
  }
}
}

OSPFv3 ospf3 {
  disable;
  export [ policy-names ];
  external-preference preference;
  overload {
    <timeout seconds>;
  }
  preference preference;
  reference-bandwidth reference-bandwidth;
  rib-group group-name;
  traceoptions {
    file name <replace> <size size> <files number> <no-stamp>
      <(world-readable | no-world-readable)>;
    flag flag <flag-modifier> <disable>;
  }
  area area-id {
    area-range network/mask-length <restrict>;
    interface interface-name {
      disable;
      dead-interval seconds;
      hello-interval seconds;
      metric metric;
      neighbor address <eligible>;
      passive;
      priority number;
      retransmit-interval seconds;
      transit-delay seconds;
    }
  }
}

```

```

nssa {
  area-range network/mask-length <restrict>;
  default-isa {
    default-metric metric;
    metric-type type;
    type-7;
  }
  (no-summaries | summaries)
}
stub <default-metric metric> <(no-summaries | summaries)>;
virtual-link neighbor-id router-id transit-area area-id {
  disable;
  dead-interval seconds;
  hello-interval seconds;
  retransmit-interval seconds;
  transit-delay seconds;
}
}
}
RIP rip {
  authentication-key password;
  authentication-type type;
  (check-zero | no-check-zero);
  graceful-restart {
    disable;
    restart-time seconds;
  }
  import [ policy-names ];
  message-size number;
  metric-in metric;
  receive receive-options;
  rib-group group-name;
  send send-options;
  traceoptions {
    file name <replace> <size size> <files number> <no-stamp>
      <(world-readable | no-world-readable)>;
    flag flag <flag-modifier> <disable>;
  }
  group group-name {
    export [ policy-names ];
    metric-out metric;
    preference preference;
    neighbor neighbor-name {
      authentication-key password;
      authentication-type type;
      (check-zero | no-check-zero);
      import [ policy-names ];
      message-size number;
      metric-in metric;
      receive receive-options;
      send send-options;
    }
  }
}
}

```

```

RIPng    ripng {
          graceful-restart {
            disable;
            restart-time seconds;
          }
          import [ policy-names ];
          metric-in metric;
          receive <none>;
          send <none>;
          traceoptions {
            file name <replace> <size size> <files number> <no-stamp>
              <(world-readable | no-world-readable)>;
            flag flag <flag-modifier> <disable>;
          }
          group group-name {
            export [ policy-names ];
            metric-out metric;
            preference number;
            neighbor neighbor-name {
              import [ policy-names ];
              metric-in metric;
              receive <none>;
              send <none>;
            }
          }
        }

Router Advertisement  router-advertisement {
                      interface interface-name {
                        current-hop-limit number;
                        default-lifetime seconds;
                        (managed-configuration | no-managed-configuration);
                        max-advertisement-interval seconds;
                        min-advertisement-interval seconds;
                        (other-stateful-configuration | no-other-stateful-configuration);
                        prefix prefix {
                          (autonomous | no-autonomous);
                          (on-link | no-on-link);
                          preferred-lifetime seconds;
                          valid-lifetime seconds;
                        }
                        reachable-time milliseconds;
                        retransmit-timer milliseconds;
                        traceoptions {
                          file name <replace> <size size> <files number> <no-stamp>
                            <(world-readable | no-world-readable)>;
                          flag flag <detail> <disable>;
                        }
                      }
                    }

```

```

Router Discovery  router-discovery {
                  disable;
                  traceoptions {
                    file name <replace> <size size> <files number> <no-stamp>
                      <(world-readable | no-world-readable)>;
                    flag flag <detail> <disable>;
                  }
                  interface interface-name {
                    min-advertisement-interval seconds;
                    max-advertisement-interval seconds;
                    lifetime seconds;
                  }
                  address address {
                    (advertise | ignore);
                    (broadcast | multicast);
                    (priority number | ineligible);
                  }
                }

```

[edit routing-instances] Hierarchy Level

```

routing-instances {
  routing-instance-name {
    description text;
    family (inet | inet6 | mpls) {
      filter {
        input filter-name;
      }
    }
    hash-key {
      family inet {
        layer-3;
        layer-4;
      }
      family mpls {
        label-1;
        label-2;
      }
    }
  }
  helpers {
    bootp {
      description description-of-service;
      interface interface-group {
        description description-of-interface;
        maximum-hop-count number;
        minimum-wait-time seconds;
        no-listen;
        server [ addresses ]
        maximum-hop-count number;
        minimum-wait-time seconds;
        server address < [ routing-instance routing-instance-name ] >;
      }
      domain {
        description description-of-service;
        server address;
        interface interface-name {
          description description-of-interface;
          no-listen;
          server address < [ routing-instance routing-instance-name ] >;
        }
      }
    }
  }
}

```

```

tftp {
  description description-of-service;
  server address < [ routing-instance routing-instance-name ] >;
  interface interface-name {
    description description-of-interface;
    no-listen;
    server address;
  }
}
traceoptions {
  file filename {
    files number;
    size bytes;
  }
  flag flag;
  level level;
}
}
sampling {
  disable;
  input {
    family inet {
      max-packets-per-second number;
      rate number;
      run-length number;
    }
  }
}
output {
  cflowd host-name {
    aggregation {
      autonomous-system;
      destination-prefix;
      protocol-port;
      source-destination-prefix {
        caida-compliant;
      }
      source-prefix;
    }
    autonomous-system-type (origin | peer);
    (local-dump | no-local-dump);
    port port-number;
    version format;
  }
  file {
    disable;
    filename filename;
    files number;
    size bytes;
    (stamp | no-stamp);
    (world-readable | no-world-readable);
  }
  port-mirroring {
    interface interface-name;
    next-hop address;
  }
}
}

```

```

    traceoptions {
      file filename {
        files number;
        size bytes;
        (world-readable | no-world-readable);
      }
    }
  }
interface interface-name ;
instance-type (forwarding | l2vpn | no-forwarding | vrf);
route-distinguisher (as-number:number | ip-address:number);
vrf-import [ policy-names ];
vrf-export [ policy-names ];
vrf-table-label;
vrf-target {
  export community-name;
  import community-name;
}
protocols {
  bgp {
    bgp-configuration;
  }
  isis {
    isis-configuration;
  }
  l2vpn {
    l2vpn-configuration;
  }
  ldp {
    ldp-configuration;
  }
  ospf {
    ospf-configuration;
  }
  pim {
    pim-configuration;
  }
  rip {
    rip-configuration;
  }
}
routing-options {
  aggregate {
    defaults {
      aggregate-options;
    }
    route destination-prefix {
      policy policy-name;
      aggregate-options;
    }
  }
  auto-export {
    (disable | enable);
    family {
      inet {
        multicast {
          (disable | enable);
          rib-group rib-group;
        }
      }
    }
  }
}

```

```

    unicast {
        (disable | enable);
        rib-group rib-group;
    }
}
}
traceoptions {
    file name <replace> <size size> <files number> <no-stamp>
        <(world-readable | no-world-readable)>;
    flag flag <flag-modifier> <disable>;
}
}
autonomous-system autonomous-system <loops number>;
confederation confederation-autonomous-system members autonomous-system;
fate-sharing {
    group group-name;
    cost value;
    from address [to address];
}
forwarding-table {
    export [ policy-names ];
}
generate {
    defaults {
        generate-options;
    }
    route destination-prefix {
        policy policy-name;
        generate-options;
    }
}
instance-export [ policy-names ];
instance-import [ policy-names ];
interface-routes {
    rib-group group-name;
}
martians {
    destination-prefix match-type <allow>;
}
maximum-routes route-limit <log-only | threshold value>;
multicast {
    scope scope-name {
        interface interface-name;
        prefix destination-prefix;
    }
    ssm-groups {
        addresses;
    }
}
options {
    syslog (level level | upto level);
}
resolution {
    tracefilter[filter-policy];
    traceoptions {
        file name <replace> <size size> <files number> <no-stamp>
            <(world-readable | no-world-readable)>;
        flag flag <flag-modifier> <disable>;
    }
}
}

```

```

rib routing-table-name {
  aggregate {
    defaults {
      aggregate-options;
    }
    route destination-prefix {
      policy policy-name;
      aggregate-options;
    }
  }
  filter {
    input filter-name;
  }
  generate {
    defaults {
      generate-options;
    }
    route destination-prefix {
      policy policy-name;
      generate-options;
    }
  }
  martians {
    destination-prefix match-type <allow>;
  }
  static {
    defaults {
      static-options;
    }
    rib-group group-name;
    route destination-prefix {
      lsp-next-hop {
        metric metric;
        preference preference;
      }
      next-hop;
      qualified-next-hop address {
        metric metric;
        preference preference;
      }
      static-options;
    }
  }
}
rib-groups {
  group-name {
    import-policy [ policy-names ];
    import-rib [ group-names ];
    export-rib group-name;
  }
}

```

```
route-distinguisher-id address;
route-record;
router-id address;
static {
  defaults {
    static-options;
  }
  rib-group group-name;
  route destination-prefix {
    lsp-next-hop {
      metric metric;
      preference preference;
    }
    next-hop;
    qualified-next-hop address {
      metric metric;
      preference preference;
    }
    static-options;
  }
}
traceoptions {
  file name <replace> <size size> <files number> <no-stamp>
  <(world-readable | no-world-readable)>;
  flag flag <flag-modifier> <disable>;
}
}
```

[edit routing-options] Hierarchy Level

```

routing-options {
  aggregate {
    defaults {
      aggregate-options;
    }
    route destination-prefix {
      policy policy-name;
      aggregate-options;
    }
  }
  auto-export {
    (disable | enable);
    family {
      inet {
        multicast {
          (disable | enable);
          rib-group rib-group;
        }
        unicast {
          (disable | enable);
          rib-group rib-group;
        }
      }
    }
  }
  traceoptions {
    file name <replace> <size size> <files number> <no-stamp>
      <(world-readable | no-world-readable)>;
    flag flag <flag-modifier> <disable>;
  }
}
autonomous-system autonomous-system <loops number>;
confederation confederation-autonomous-system members autonomous-system;
fate-sharing {
  group group-name;
  cost value;
  from address [to address];
}
forwarding-table {
  export [ policy-names ];
  unicast-reverse-path (active-paths | feasible-paths);
}
generate {
  defaults {
    generate-options;
  }
  route destination-prefix {
    policy policy-name;
    generate-options;
  }
}
graceful-restart {
  disable;
  path-selection-defer-time-limit time-limit;
}

```

```

instance-export [ policy-names ];
instance-import [ policy-names ];
interface-routes {
    rib-group group-name;
}
martians {
    destination-prefix match-type <allow>;
}
maximum-routes route-limit <log-only | threshold value>;
multicast {
    scope scope-name {
        interface interface-name;
        prefix destination-prefix;
    }
    ssm-groups {
        address;
    }
}
options {
    syslog (level level | upto level);
}
resolution {
    tracefilter[ policy-names ];
    traceoptions {
        file name <replace> <size size> <files number> <no-stamp>
        <(world-readable | no-world-readable)>;
        flag flag <flag-modifier> <disable>;
    }
}
rib routing-table-name {
    aggregate {
        defaults {
            aggregate-options;
        }
        rib-group group-name;
        route destination-prefix {
            policy policy-name;
            aggregate-options;
        }
    }
}
filter {
    input filter-name;
}
generate {
    defaults {
        generate-options;
    }
    route destination-prefix {
        policy policy-name;
        generate-options;
    }
}
martians {
    destination-prefix match-type <allow>;
}

```

```

static {
  defaults {
    static-options;
  }
  rib-group group-name;
  route destination-prefix {
    lsp-next-hop {
      metric metric;
      preference preference;
    }
    next-hop;
    qualified-next-hop address {
      metric metric;
      preference preference;
    }
    static-options;
  }
}
}
rib-groups {
  group-name {
    import-policy [ policy-names ];
    import-rib [ group-names ];
    export-rib group-name;
  }
}
route-distinguisher-id address;
route-record;
router-id address;
static {
  defaults {
    static-options;
  }
  rib-group group-name;
  route destination-prefix {
    lsp-next-hop {
      metric metric;
      preference preference;
    }
    next-hop;
    qualified-next-hop address {
      metric metric;
      preference preference;
    }
    static-options;
  }
}
}
tracoptions {
  file name <replace> <size size> <files number> <no-stamp>
  <(world-readable | no-world-readable)>;
  flag flag <flag-modifier> <disable>;
}
}

```

